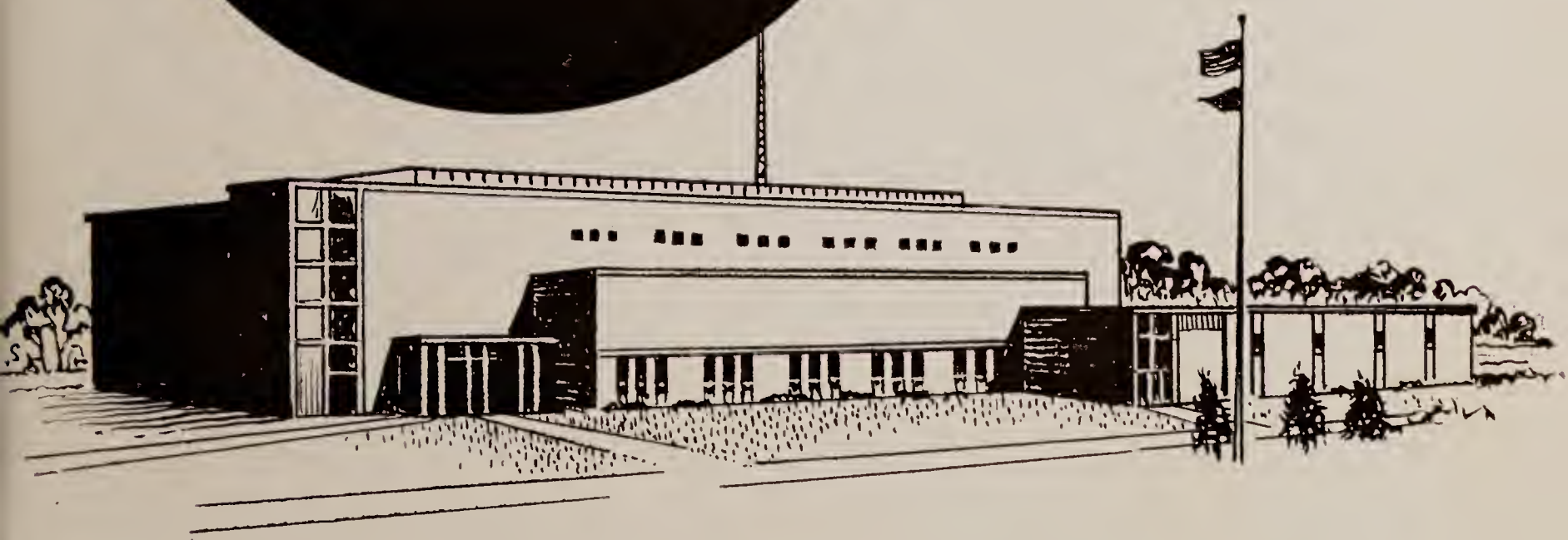


ANNOUNCEMENTS 1973-74

NORTH CENTRAL CAMPUS Westville



PURDUE UNIVERSITY BULLETIN

Campus Calendar

1973

SEPTEMBER							NOVEMBER						
S	M	T	W	T	F	S	S	M	T	W	T	F	S
						1					1	2	3
2	3	4	5	6	7	8	4	5	6	7	8	9	10
9	10	11	12	13	14	15	11	12	13	14	15	16	17
16	17	18	19	20	21	22	18	19	20	21	22	23	24
23	24	25	26	27	28	29	25	26	27	28	29	30	
30													
OCTOBER							DECEMBER						
S	M	T	W	T	F	S	S	M	T	W	T	F	S
		1	2	3	4	5							1
7	8	9	10	11	12	13	2	3	4	5	6	7	8
14	15	16	17	18	19	20	9	10	11	12	13	14	15
21	22	23	24	25	26	27	16	17	18	19	20	21	22
28	29	30	31				23	24	25	26	27	28	29
							30	31					

Fall Semester

August 30
Classes begin

November 22
Thanksgiving vacation begins

November 26
Classes resume

December 15
Classes end

December 17
Finals begin

December 22
Semester ends

1974

JANUARY							MAY						
S	M	T	W	T	F	S	S	M	T	W	T	F	S
			1	2	3	4				1	2	3	4
6	7	8	9	10	11	12	5	6	7	8	9	10	11
13	14	15	16	17	18	19	12	13	14	15	16	17	18
20	21	22	23	24	25	26	19	20	21	22	23	24	25
27	28	29	30	31			26	27	28	29	30	31	
FEBRUARY							JUNE						
S	M	T	W	T	F	S	S	M	T	W	T	F	S
						1							1
3	4	5	6	7	8	9	2	3	4	5	6	7	8
10	11	12	13	14	15	16	9	10	11	12	13	14	15
17	18	19	20	21	22	23	16	17	18	19	20	21	22
24	25	26	27	28			23	24	25	26	27	28	29
							30						
MARCH							JULY						
S	M	T	W	T	F	S	S	M	T	W	T	F	S
						1			1	2	3	4	5
3	4	5	6	7	8	9	7	8	9	10	11	12	13
10	11	12	13	14	15	16	14	15	16	17	18	19	20
17	18	19	20	21	22	23	21	22	23	24	25	26	27
24	25	26	27	28	29	30	28	29	30	31			
31													
APRIL							AUGUST						
S	M	T	W	T	F	S	S	M	T	W	T	F	S
		1	2	3	4	5					1	2	3
7	8	9	10	11	12	13	4	5	6	7	8	9	10
14	15	16	17	18	19	20	11	12	13	14	15	16	17
21	22	23	24	25	26	27	18	19	20	21	22	23	24
28	29	30					25	26	27	28	29	30	31

Spring Semester

January 7
Classes begin

March 4-9
Spring vacation

April 27
Classes end

April 29
Finals begin

May 4
Semester ends

May 9
Commencement

Summer Session, 1974

June 17
Classes begin

July 4
Holiday, no classes

August 9
Session ends

PURDUE UNIVERSITY BULLETIN

Volume 73

January 31, 1973

Number 11

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North Central Campus

Announcements for the Year 1973-74



PUBLISHED BY THE UNIVERSITY
WESTVILLE, INDIANA



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PURDUE UNIVERSITY

Regional Campus Administration

West Lafayette, Indiana

OFFICERS OF ADMINISTRATION AND INSTRUCTION

Administrative Officers

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Dean of the Graduate School
WILLIAM J. FISCHANG, Ph.D. Vice President for Student Services
C. H. LAWSHE, Ph.D. Vice President for Regional Campus Administration
and Dean of Continuing Education

Regional Campus Administration

G. W. BERGREN, M.S.M.E. Administrative Dean for Academic Affairs
L. O. NELSON, Ph.D. Administrative Dean for Student Services
N. M. PARKHURST, M.S. Registrar
D. A. SCOTT, Ph.D. Administrative Dean for Development
J. E. THATCHER, B.S.B.A. Director of Regional Campus Business Affairs
C. A. HENRY, M.S. Director of Admissions

North Central Campus Administrative Staff

JOHN W. TUCKER, Ed.D. Dean and Director
JAMES R. BLACKWELL, M.A., M.B.A. Assistant Dean for Administration
JAMES J. COUNTRYMAN, Ph.D. Assistant Dean for Academic Affairs
GEORGE W. BACK, B.S. Bursar-Accounting Manager
JOHN K. BLACK, B.S.I.M. Business Manager
HARVEY D. MOORE, Ph.D. Coordinator of Continuing Education
DAVID P. KONZELMANN, M.S. Admissions Officer
RICHARD G. MEHLER, M.S. Registration Officer
ROBERT F. SCHWARZ, M.S. Director of Campus Relations
BRUCE E. TURNER, B.S. Computer Center Manager
JOHN J. WAGLIARDO, Ph.D. Student Affairs Officer
MELVIN L. ROSS, JR., M.A. Assistant Student Affairs Officer

General Information

PURDUE UNIVERSITY is the Indiana link in a nationwide chain of 68 land grant colleges and universities. It is a people's university grown out of the demand of the American people that higher education be the birthright of the many, not the privilege of the few.

Long pre-eminent in agriculture, engineering, and science, Purdue has more recently become strong in the humanities and technology.

The year 1969 marked the centennial of Purdue University. From an institution of six instructors and 39 students, Purdue has grown to a major university with a faculty of over 2,200 and a student body of more than 38,000 on four campuses and at Indiana University-Purdue University at Indianapolis (IUPUI).

LOCATION

Purdue University has, in addition to its main campus in West Lafayette, established a series of regional campuses for the purpose of offering educational opportunities in the major population areas of Indiana. The North Central Campus is an outgrowth of the former Barker Memorial Center which was located in Michigan City. The North Central Campus serves communities in the north central part of the state. It is located on a 216-acre site at the junction of the Indiana Toll Road and U. S. 421 at Westville.

HISTORY OF THE NORTH CENTRAL CAMPUS

Following World War II Purdue University started offering courses in facilities loaned to the University by the Michigan City and LaPorte schools. The programs in each of these areas grew, and in 1948 the Barker Welfare Foundation made available to the University the John Barker mansion. All of the area classes were consolidated in this fine old structure in the spring of 1949. Through the 1950s enrollments at the Barker Memorial Center continued to grow, as did the population of the north central region of the state. By the early 1960s it was evident that this part of the state was due for a population boom and significant industrial expansion, and Purdue began to make plans for a new regional campus that could more adequately serve the area.

In May of 1962 Purdue University, through the Ross-Ade Foundation, purchased 160 acres in LaPorte County at a location that could best serve the Tri-City area of LaPorte, Michigan City, and Valparaiso.

With the site available, serious planning started on the development of the first building for the new campus. This building, containing 90,000 square feet, provided modern academic facilities when it opened its door in 1967.

In the short span of time since 1967, the North Central Campus has undergone many changes. They are all indicative of the rapid growth of the area it serves, and the increasing educational demands the campus must meet.

Two additional parcels of land have been added to the original holding of 160 acres making a total acreage of 216 acres.

In September 1968, construction was begun on a \$750,000 addition on the east side of the building. One year later the addition was ready for occupancy.

In conjunction with the addition, 7,000 square feet of space in the basement of the original structure was completed. It now houses the data processing equipment and classrooms, student activities space, and the equipment for TV reception and transmission.

In 1969, the Indiana General Assembly appropriated funds for construction of a second building which is currently under construction.

Prestige of the North Central Campus has been further enhanced with the North Central Association of Colleges and Secondary Schools award of an operationally separate accreditation from the Purdue system.

Accreditation attests to the quality of the faculty and staff, the excellence of courses and curricula, and the adequacy of facilities in the goals of this campus.

ORGANIZATION

The North Central Campus operates as an integral part of Purdue University. Faculty members hold their appointments in Purdue departments and teach courses under departmental control. With the exception of courses in the School of General Studies, course numbers and content are the same for all campuses of the University. Faculty members receive promotion through a university-wide promotion system.

PURPOSE AND FUNCTION

Purdue University North Central Campus is dedicated to service in the land grant tradition. As a regional campus, Purdue North Central continues this tradition by bringing educational opportunities of a great University to a constantly increasing number of students who might otherwise not be able to share the benefits of the University.

It is the function of the Purdue North Central Campus to provide courses and programs for regular full-time university students working toward degrees. At the same time, it is also the purpose of the institution to make similar opportunities available to part-time students, most of whom are pursuing their educational objectives in the evening.

As a member of the community of northern Indiana, Purdue North Central has a strong obligation to provide educational opportunities, both credit and noncredit, related to the nature of the population and the social, economic, and industrial development of the area. In accordance with the long-standing policy of the Board of Trustees of Purdue University, all educational services and programs of the University are available and open to all

academically qualified individuals without any discrimination whatsoever with respect to creed, national origin, race, or sex.

PROGRAMS

Although academic work at a number of different levels is offered at Purdue North Central Campus, primary emphasis is on freshman and sophomore curricula requirements offered by the University which lead to a Bachelor of Science or Bachelor of Arts degree.

Two-year, terminal, associate-degree curricula in nursing and various fields of technology are also a major part of the offerings.

Selected graduate courses in a limited number of subject-matter fields, primarily to serve the needs of area teachers, are regularly scheduled at the campus.

Programs, conferences, and short courses, mostly noncredit, related to the interests of the people in the communities served by the Purdue North Central Campus are offered through the Office of Continuing Education.

A nondegree status is available to students who are either unsure of themselves or their goals, or to those who are interested in taking a course or two for personal benefit.

A new school, the Purdue North Central School of General Studies, has been formally approved by the faculty of Purdue North Central and the Board of Trustees of Purdue University. The purpose of this school is to make post high school educational opportunities more accessible to a broader range of students. The first curriculum in the School of General Studies is a "bridge program" designed to help students bridge the gap from high school to college. Special courses designed to aid the student in areas of math, communication, and study skills are included.

Many students who do not plan to complete a degree at any of the campuses of Purdue University use the North Central Campus to obtain one or two years of credits for transfer to other universities. Since the work taken at the North Central Campus carries regular Purdue University credit, transferability to other universities presents no problem.

Admission

GENERAL REQUIREMENTS

ALL PERSONS wanting to take advantage of the opportunity for higher education at the North Central Campus of Purdue University must file an application for admission. Requests for information and application forms should be addressed to the Office of Admissions, Purdue University, North Central Campus, Junction U. S. 421 and Indiana Toll Road, Westville, Indiana 46391. Students pursuing the baccalaureate and associate degree programs must be high school graduates. A prospective student should complete the application according to instructions and then forward the form to the high school from

which he is to be or already has been graduated. The high school should then complete the application and return it to the Office of Admissions, Purdue North Central Campus, Junction U. S. 421 and Indiana Toll Road, Westville, Indiana 46391. High school students should make application during their seventh semester of high school, or as soon as possible thereafter. High school graduates should make application immediately. This enables the University to evaluate fully an applicant's eligibility for consideration and to notify the applicant at an early date of the action taken, thus allowing the applicant to make his educational plans.

An individual's eligibility for consideration will depend upon many factors, among which are: (1) subject matter requirements for the school or program to which he is applying; (2) high school class standing; (3) College Entrance Examination Board test results; (4) high school comments and recommendations; (5) previous college work, if any; and (6) other personal information.

Admission Requirements for Indiana Residents

SCHOOL	CLASS RANK	REQUIRED SUBJECT MATTER					Tests Required
		Math	Science	English	For. Lang.		
Engineering	UPPER 1/2	3 sem. alg. 2 sem. geom. 1 sem. trig.	2 sem. lab science	6 sem.	NONE	Achievement Tests—Spring of Senior Year Preferred Math English Chemistry (no science test required if student has not had chemistry)	
Science and Pharmacy	UPPER 1/2	3 sem. alg. 2 sem. geom. 1 sem. trig.	2 sem. lab science	6 sem.	NONE		
Industrial Management	UPPER 1/2	2 sem. alg. 2 sem. geom. 2 sem. other acad. math.	2 sem. lab science	6 sem.	NONE		
Humanities, Social Science, and Education	UPPER 1/2	2 sem. alg. 2 sem. geom.	2 sem. lab science	8 sem.	4 sem.		
Home Economics	UPPER 1/2	2 sem. alg. 2 sem. geom.	2 sem. lab science	6 sem.	NONE		
Agriculture, Forestry, and Pre-Veterinary Science and Medicine	UPPER 2/3	2 sem. alg. 2 sem. geom.	2 sem. lab science	6 sem.	NONE		
Technology	UPPER 2/3	2 sem. alg. 2 sem. geom.	2 sem. lab science	6 sem.	NONE		
Physical Education for Men	UPPER 2/3	NONE	2 sem. lab science	6 sem.	NONE		

Out-of-State Requirements

Out-of-state students will be selected from among those applicants who meet subject matter requirements and who rank in the upper third of their graduating class or the third of Purdue's distribution of the SAT.

All sons and daughters of Purdue alumni will be considered for admission eligibility on in-state requirements.

On the basis of the factors considered, action on the individual's application may be one of the following:

1. Granted unqualified regular admission—this means that the applicant has met all entrance standards and requirements for admission.
2. Admitted unclassified (on probation) or to the School of General Studies—this applies to the applicant whose academic background and preparation do not meet the entrance standards and/or requirements, but who the University feels has a reasonable chance of gaining regular admission at a later date.
3. Admission denied or postponed until an adequate academic background and preparation can be demonstrated.

Any admission to the University is provisional pending the receipt of all required student information. The University reserves the right to cancel any admission if a student fails to provide all necessary credentials.

TRANSFER STUDENTS

An applicant transferring from another college or university must fulfill the following requirements in order to be considered for admission:

1. Submit an application for admission on the prescribed form through the high school from which he was graduated, including the CEEB test results.
2. Forward an official transcript of work done in institutions previously attended to the Office of Admissions at the North Central Campus.
3. Transfer students must meet subject matter requirements, have a strong C average (out-state students B), and be in good standing at all schools attended.

Credit earned at other institutions will be evaluated in terms of how it fulfills the graduation requirements at Purdue University. Evaluation of credit is completed after a student is admitted to the University.

NONDEGREE STUDENTS

Persons who desire to take advantage of the instruction in any of the departments of the University without undertaking one of the regular plans of study and without becoming a candidate for a degree may be admitted as nondegree students. Such students must present evidence that they are prepared to undertake the work desired and must progress satisfactorily in their work.

Admission as a nondegree student is for one semester only and any further enrollment must be approved by the Office of Admissions. A maximum of 11 credit hours may be taken in any one semester and a maximum of 24 credit hours may be taken while classified as a nondegree student.

A personal interview with a member of the Office of Admissions staff prior to admission as a nondegree student is encouraged. Any student who is registered in another college or university and wishes to attend Purdue during the same semester must submit a letter from the other institution approving the specific courses to be taken at the North Central Campus. All students who

have been previously enrolled in another institution must have a letter of good scholastic and social standing on file with the Office of Admissions prior to enrollment. Application for admission as a nondegree student should be made to the Office of Admissions at the North Central Campus.

RE-ENTRY STUDENTS

Any person in good standing who has formerly attended Purdue but has not been in attendance for a semester or more must submit an application for reentry. Each individual situation will determine the status of the person's eligibility for reentry.

RE-ADMISSION OF STUDENTS

Any person who has been formally dropped from the University for academic reasons and wishes to re-enter must make application for re-admission to the Scholastic Delinquencies and Re-admissions Committee. Forms for initiating this procedure are available in the Student Affairs Office at the North Central Campus.

ADVANCED PLACEMENT AND ADVANCED CREDIT

What Is Meant by Advanced Placement and Advanced Credit?

1. Advanced placement means that a student is placed in an advanced level course but no credit toward a degree is awarded for prior courses.
2. Advanced credit means that college credit is established in one or more subjects and the total credit is recorded on the student's record.

Who Should Consider Establishing Advanced Credit?

The student who has taken a strong college preparatory program, has achieved at a high level, and has strong test results should seriously consider the possibility of establishing advanced credit. Personal factors as well as your academic record should be considered.

How Is Advanced Placement and/or Advanced Credit Established?

Advanced credit or advancement placement can be established by any of the following methods.

1. The Purdue Advanced Credit Examinations.

The Purdue Advanced Credit Examinations will be given during the summer advanced enrollment program (a student's Day on Campus) and during the delayed enrollment period just before classes begin. A description of the subject matter to be covered in the examination, test dates and locations, procedures to follow in applying to take the tests, and general instructions will be mailed to each student qualified to be considered for advanced credit. Any questions about advanced credit should be directed to the director of the counseling staff of your school.

2. The College Board Advanced Placement Program.

Credit can be established on the basis of test results taken at the completion of the advanced placement course in high school. The score required to establish credit varies according to the test.

Subject Area	AP Score	Purdue Credit Granted
Biological Sciences	4 or 5	3 semester hours
Chemistry	4 or 5	8 semester hours
English	3, 4, or 5	3 semester hours
History		
American	3, 4, or 5	6 semester hours
European	3, 4, or 5	3 semester hours
Math	3, 4, or 5	5 to 10 semester hours depending on the grade
Modern Language	3, 4, or 5	At least 6 semester hours
Physics	3, 4, or 5	4 semester hours

College Level Examination Program (CLEP)

The College Level Examination Program is designed for the purpose of evaluating nontraditional college-level education such as independent study, correspondence work, and credit earned from nonaccredited institutions.

1. General examinations

No credit will be given on the basis of the general examination. Transfer students who previously attended a nonaccredited institution may take the general examination. If an average score of 500 or above is received on the five tests, the credit established at the nonaccredited institution may be evaluated for credit at Purdue.

2. Subject matter examinations

Purdue credit may be established by taking certain subject matter examinations. A list of examinations approved by the faculty and the score required to establish Purdue credits are available upon request.

AUDITING CLASSES

Courses may be audited. No grades or credits are received. Attendance in class is permissible when the regular class fees are paid and the individual has declared himself as a visitor.

RESERVE OFFICER TRAINING

Male students planning to transfer to the West Lafayette Campus are now eligible for a new two-year advanced ROTC program leading to a commission in the Army and Air Force. The program is available to anyone having four full academic semesters remaining on the West Lafayette Campus, including graduate school. The Air Force offers this program to females also. The Navy does not offer a two-year ROTC program; however, other naval programs for reserve officer training are available.

Students applying for the two-year program and accepted by the service concerned attend a six-week summer training camp during the summer immediately preceding their planned entry into ROTC classes, which may be either in the fall or spring semester. This six-week training substitutes for the first two years of basic ROTC. Students are paid approximately \$325 during this six weeks plus transportation, housing, and all meals.

Two-year students receive the same benefits as four-year ROTC cadets. These include draft deferment, \$100 per month allowance, free uniforms, and free military textbooks. Flight training is available in the last year for those who are interested and qualify. This consists of about 361½ hours of flight instruction and 35 hours of ground school at no cost to the student. Upon completion the student may be granted a private pilot's license.

There is no obligation incurred in applying for this program, or in taking the examinations for the Army and Air Force. Applications are accepted at any time up to about March 1 preceding the six-week summer training.

For further information and additional details you may call or write:

Professor of Military Science
U. S. Army ROTC
Purdue University
West Lafayette, Indiana 47907
Telephone: 749-2808

Professor of Aerospace Studies
U. S. Air Force ROTC
Purdue University
West Lafayette, Indiana 47907
Telephone: 749-2120

Professor of Naval Science
U. S. Naval ROTC
Purdue University
West Lafayette, Indiana 47907
Telephone: 749-48156

Registration

ADVANCED REGISTRATION

CURRENT STUDENTS should preregister for fall, spring, and summer sessions at announced times. New students should preregister at the times specified by the registration officer. Advanced registration eliminates standing in line and assures preferential scheduling.

DELAYED REGISTRATION

For students who are unable to preregister, a registration period is held just prior to the beginning of classes. Consult the current semester schedule for dates and times.

LATE REGISTRATION

The late registration period for the fall and spring semesters ends one week after the first day of classes. In the summer session, the late registration period closes three days after the first day of classes. Late registration fees are explained on page 16.

DROPPING AND ADDING COURSES

A student may add a course to his schedule only during the first week of classes (first three days of summer school). In order to effect a withdrawal from any class, a student must secure the signature of his adviser. Notify the Registration Office at the time of withdrawal. Discontinuance of class attendance is not the basis for withdrawal, and students who do not notify the office when they plan to withdraw will be given a failing grade in each course involved. To drop a course, consult the fee refund schedule on page 16 and the directed grades explanation on page 18.

TRANSFER OF ENROLLMENT TO THE WEST LAFAYETTE CAMPUS

Upon the completion of any semester or summer session a student may transfer his enrollment from the North Central Campus to the West Lafayette Campus. To initiate this process the student must report to the registration officer and complete the necessary forms. Following this procedure he will receive an "Authorization for Enrollment" form from the West Lafayette Campus along with instructions for registration. Only students attending on regular status may transfer to the West Lafayette Campus.

"Unclassified" students must be admitted to a school before they are eligible to transfer. It is not recommended that a student transfer at mid-year.

Student Services

COUNSELING CENTER

COUNSELING PERSONNEL ARE AVAILABLE for consultation about any problem—personal or general. The center is in addition to academic advisers who assist students enrolling in an academic program. The emphasis of counseling is placed on working with the personal problems of students by helping them to learn and to apply knowledge about themselves in the total context of their daily living.

To achieve this goal, the center offers help to students by providing the following services:

Counseling
 Group and individual
 Personal and adjustment
 Social
 Vocational
 Educational
 Marriage and family

Testing
 Achievement
 Aptitude
 Personality
 Mental ability
 Interest

Faculty advisers are assigned to assist each student to work out a program of study that will include all required courses and a wise choice of electives.

Students who have enrolled at Purdue North Central and who plan to transfer to a campus other than a Purdue campus, should notify their adviser of such intention.

Advisers will then be able to assist the transferee in planning a program that will be acceptable to both Purdue North Central and his future school.

Students should bring a catalog of the institution to which they intend to transfer whenever they meet with their adviser.

The Purdue North Central library maintains catalogs of many other universities. Students should ascertain whether or not a current copy is available. If not, they should procure one from the registrar of their intended university.

FINANCIAL AID

Scholarships

No student may be considered for financial assistance until he has been admitted to the University. High school students who plan to attend Purdue should apply for admission after completion of the junior year and arrange to take the appropriate CEEB tests in May of that year in order to insure early consideration of their requests for financial aid.

Students should make clear when filling in the application for financial aid that they plan to attend the North Central Campus. Most scholarship applicants will be notified of the action on their applications before their graduation from high school.

National Direct Loans

Entering freshmen follow the same procedure outlined for acquiring scholarships except that requests for loan applications should be directed to: Admissions and Financial Aids Office, Purdue North Central Campus, Junction U. S. 421 and Indiana Toll Road, Westville, Indiana 46391.

Aid for Current Students

Financial aid in the form of scholarships and loans is available for students already enrolled at the North Central Campus. Applications should be filed six to eight weeks before the start of the semester aid is desired.

STUDENT EMPLOYMENT

Many area industries list their part-time job opportunities with the Student Affairs Office. Students who need a part-time job to help finance their education should register in the Student Affairs Office.

Students whose families cannot contribute a significant portion of the cost of educational expenses may qualify for the Work-Study Program. Work-study jobs are available during the school year and during the summer on campus and with area contracting agencies. Incoming freshmen may qualify for work-study the summer before attending Purdue North Central.

INSURANCE

Low cost University accident and health insurance similar to the policy offered at the West Lafayette Campus is offered annually to all students carrying an academic load of eight hours or more. Students may take advantage of the opportunity at the beginning of each semester.

STUDENT ACTIVITIES

Purdue encourages its students to participate in student activities in the belief that membership in an organization not only provides a broader educational base for the individual, but also adds wider experience to his personal assets. Many students find an opportunity to convert classroom theory into practical use in this manner. A number of clubs and organizations are active at the North Central Campus. The clubs are generally self-directed and draw on the faculty for sponsorship and advice. Any registered student is eligible to participate in the activity program.

Fees

FEES ARE SUBJECT to change by the Board of Trustees without notice. All fees are payable at the time of registration each semester.

Course Fees. Purdue North Central has a fee structure different from that at the West Lafayette Campus. Fees are based on an established amount per credit hour, plus a laboratory fee if the course includes laboratory work.

	Resident	Nonresident
Undergraduate	\$20 per credit hour plus \$5 per lab hour	\$40 per credit hour plus \$5 per lab hour
Graduate	\$25 per credit hour plus \$5 per lab hour	\$50 per credit hour plus \$5 per lab hour

N.B.—Undergraduate students pay undergraduate fees; graduate students pay graduate fees regardless of the course number or the objective for which the course is taken. (A graduate student is one who has been awarded a baccalaureate degree.)

Costs for two semesters for full-time undergraduate students:

	Indiana Residents	Nonresidents
University fees*	\$670	\$1,370
Books and supplies	150	150
	<hr/>	<hr/>
Total	\$820	\$1,520

This total does not include the cost of transportation, housing, and meals which will depend upon an individual's own desires.

Late Registration Fees. The charge for the late registration is \$5 per course with a maximum of \$25, beginning on the first day of classes.

Breakage Fees. Course fees include the cost of normal breakage and wear and tear on equipment. An additional charge will be levied against individuals for excessive waste, loss, or breakage that may occur. Such special charges must be paid before course credit will be given.

Diploma Fees. All students must pay a \$10 diploma fee not less than 30 days before the close of the semester in which they expect to complete their work for an associate degree.

Refunds. Course fees will be refunded under any one of the following conditions:

Period of Withdrawal	Refund Percentage	
	Semester	Summer Session
First week	100	100
Second week	60	40
Third week	40	0
Fourth week	20	0
Fifth week	0	0

To be eligible for a refund, the student must notify in person the registration officer and complete the necessary withdrawal procedures.

Special Examination Fees. To establish credit by examination, a nondegree student or a student currently enrolled carrying less than 12 credit hours must pay a fee of \$25 per course.

Withdrawal. In order to effect a withdrawal from any class, a student must notify his assigned faculty adviser and registration officer at the time of withdrawal. Discontinuance of class attendance is not the basis for withdrawal, and students who do not notify the Registration Office when they plan to withdraw will be given a failing grade in each course involved.

* Varies slightly depending upon the courses selected.

Grading

ASSIGNING OF GRADES

INSTRUCTORS WILL ASSIGN each student a grade for each course in which he is enrolled at the close of a session. The student shall be responsible for the completion of all required work by the time of the last scheduled meeting in the course unless his assignment to the course has been properly cancelled. The grade shall indicate the student's achievement with respect to the objectives of the course.

For Credit Courses:

A—highest passing grade.

B

C

P—passing grade for the pass/not pass option.

D—lowest passing grade; passing minimal objectives of the course.

E—conditional failure; failure to achieve minimal objectives, but only to such limited extent that credit can be obtained by examination or otherwise without repeating the entire course. This grade represents failure in the course unless and until the record is duly changed within one semester. It cannot be changed to a grade higher than a D.

F—failure to achieve minimal objectives of this course. This student must repeat the course satisfactorily in order to establish credit in it.

N—not passing for the pass/not pass option. Issued when the student's grade would be a D or F under the letter grade option.

Pass/Not Pass Option. The pass/not pass option provides students with the opportunity to broaden their educational foundations with minimal concern for grades earned. The option is open to all students in the University subject to the regulations of the school in which the student is enrolled. Subject to the regulations of his school, a student may elect this option in any course which does not already appear on his academic record and in which he is otherwise eligible to enroll for credit with letter grade. A student may not elect this option for more than 20 percent of the total credit hours required for his graduation.

A student who is enrolled in a course under this option has the same obligations as those who are enrolled in the course for credit with letter grade. When the instructor reports final grades in the course, he will report that any such student who would have earned a grade of A, B, or C has passed the course, and that any other such student has not passed.

For Zero Credit Courses (including thesis research but not including laboratory portions of courses in which, for purposes of scheduling, separate course designation and separate class cards are used for the laboratory sections):

S—satisfactory; meets course objectives.

U—unsatisfactory; does not meet course objectives.

For Incomplete Work, either credit or noncredit:

O—incomplete; no grade; a temporary record of work which was interrupted by unavoidable absence or other causes beyond a student's

control, and which work was passing at the time it was interrupted. An instructor may require the student to secure the recommendation of the student affairs officer that the circumstances warrant a grade of incomplete. On the record a grade of O will be equivalent to a W unless and until the record is duly changed within one semester or the next semester the course is offered.

OP—incomplete, for pass/not pass option. Has the same provisions as the O for letter grade option.

Directed Grades. The registration officer is directed to record the following grades and symbols under special circumstances:

W—withdrew; a record of the fact that a student was enrolled in a course and withdrew or cancelled the course after the last date for late registration.

WF—withdrew failing; a record of course cancellation after the last date for canceling a course without grade, at which time, according to a statement from the instructor, the student was not passing in his work. This grade counts in all respects as a failing grade. A grade of WF may be directed by the dean of men, the dean of women, or the Committee on Scholastic Delinquency and Re-admission when a student is dropped from a course for serious scholastic delinquency.

GOOD STANDING

For purposes of reports and communications to other institutions and agencies and in the absence of any further qualification of the term, a student shall be considered in good standing unless he has been dismissed, suspended, or dropped from the University and has not been readmitted.

SCHOLARSHIP INDEXES

The scholarship standing of all regular students enrolled in programs leading to an undergraduate degree shall be determined by two scholarship indexes, the semester index and the graduation index.

1. The semester index is an average determined by weighting each grade received during a given semester by the number of semester hours of credit in the course.
2. The graduation index is a weighted average of all grades received by a student while in the curriculum in which he is enrolled plus all other grades received in courses taken in other curricula offered by the University and properly accepted for satisfying the requirements of the curriculum of the school in which the student is enrolled. With the consent of his adviser, a student may repeat a course. In the case of courses which have been repeated or in which conditional grades have been removed by examination or for which a substantially equivalent course has been substituted, the most recent grade received shall be used.

3. For the purpose of averaging, each grade shall be weighted in the following manner:

A—6 x semester hours = index points

B—5 x semester hours = index points

C—4 x semester hours = index points

D—3 x semester hours = index points

E, F, WF—2 x semester hours = index points

O, W not included

GRADUATION INDEX REQUIREMENT

For the associate degree: a minimum graduation index of 3.90 shall be required for graduation.

For the bachelor's degree: a minimum graduation index of 4.00 shall be required for graduation.

SCHOLASTIC PROBATION

A candidate for the bachelor's or associate degree shall be placed on probation if his semester or graduation index at the end of any semester is less than that required for a student with his classification as shown in Table A. A student on probation shall be removed from that status at the end of the first subsequent semester in which he achieves semester and graduation indexes equal to or greater than those required for a student with his classification as shown in Table A. Any grade change due to a reporting error will require reconsideration of probation status.

Temporary students who do not achieve academic standing required of regular students may not be permitted to continue in attendance. Probation is concerned only with the regular semesters and not with the summer sessions and intensive courses.

DROPPING OF STUDENTS FOR SCHOLASTIC DEFICIENCY

A student on scholastic probation shall be dropped from the University if at the close of any semester the semester or graduation index is less than that required of a student with his classification as shown in Table B. This rule shall not apply for the semester in which the student completes all requirements for his degree. A student dropped by this rule and later duly readmitted as a regular student shall be readmitted on probation.

Applications for readmission to the University from students who have been dropped for academic reasons must be accompanied by a check or money order, not cash, for \$50 made payable to Purdue University. Processing of the application will not begin until the fee is paid. Applications may be obtained from the Student Affairs Office.

TABLE A. INDEX LEVELS FOR PROBATION

S = Semester Indexes; G = Graduation Index

Classification	S	G
1	3.5	3.5
2	3.5	3.5
3	3.6	3.75
4	3.6	3.90
5	3.7	3.95
6	3.7	4.0
7	3.7	4.0
8 and up	3.7	4.0

TABLE B. INDEX LEVELS FOR DROPPING

S = Semester Index; G = Graduation Index

Classification	S	G
1*	3.2	3.2
2	3.3	3.3
3	3.4	3.5
4	3.4	3.6
5	3.5	3.7
6	3.5	3.8
7	3.5	3.85
8 and up	3.5	3.9

DISTINGUISHED STUDENTS

Regular undergraduate students, carrying at least 14 semester hours, who successfully complete all their courses with a grade C or higher and obtain a semester scholarship index of 5.50 or better will be designated as distinguished for that semester.

DEGREES WITH DISTINCTION

Degrees are awarded at the end of each semester and summer session to candidates who have completed the requirements of their schools. At each of these periods degrees with distinction are awarded to those completing the undergraduate plans of study under the following rules:

1. Distinction at graduation shall be awarded on the basis of all course work taken. Baccalaureates with distinction shall be granted only to those who complete the four (or five) year curricula at Purdue and not to those who complete only the first three years at Purdue.
2. A candidate for the baccalaureate with distinction must have earned at least 70 hours of credit at Purdue. A candidate for an associate degree with distinction must have earned at least 45 hours of credit at Purdue.

For any student to qualify for distinction, his scholarship index for all work completed must be at least 5.00.

* Affects only students entering on probation.

3. If the number of graduates in any school who qualify for distinction under rules (1) and (2) exceed one-tenth of the total number of graduates from that school and for that semester or summer session, the number of degrees with distinction shall be limited to one-tenth of the class in that school, and those graduates with the highest indexes shall be included. In administering this rule all baccalaureate engineering graduates will be considered as one school and all associate degree graduates will be considered as one school.
4. Of those students who qualify for distinction under these rules, the three-tenths of the baccalaureate graduates having the highest indexes shall be designated as graduating with highest distinction, irrespective of the schools to which they may belong. The three-tenths of the associate degree graduates having the highest indexes will be designated as graduating with highest distinction.
5. No student with a record of faculty discipline shall be included without special approval by the faculty.

Plans of Study

ABBREVIATIONS

A&D—Art and Design	ECON—Economics	HIST—History
AGEC—Agricultural Economics	ED—Education	HORT—Horticulture
AGR—Agriculture	EE—Electrical Engineer- ing	IAT—Industrial Arts Teaching
AGRY—Agronomy	EET—Electrical Engi- neering Tech- nology	IET—Industrial Engineer- ing Technology
ANSC—Animal Sciences	EG—Engineering Graphics	IT—Industrial Technology
ANTH—Anthropology	ENGL—English	INDM—Industrial Man- agement
ART—Architectural Technology	ENGR—Engineering	IS—Industrial Supervision
BCHM—Biochemistry	ESC—Engineering Sciences	MA—Mathematics
BIOL—Biological Sciences	F&N—Foods and Nutrition	ME—Mechanical Engi- neering
CE—Civil Engineering	FOR—Forestry and Conservation	MSE—Materials Science and Metallurgical Engineering
CET—Civil Engineering Technology	FR—French	MET—Mechanical Engi- neering Tech- nology
CHE—Chemical Engineering	GEOS—Geosciences	MTT—Metallurgical Engineering Technology
CHM—Chemistry	GER—German	MUS—Music
CHT—Chemical Technology	GNT—General Studies, Technology	NT—Nursing Technology
CS—Computer Sciences	GS—General Studies, Humanities	
C&T—Clothing and Textiles		
COM—Communication		
CPT—Computer Technology		

PCOL—Pharmacology	PHAR—Pharmacy	RUSS—Russian
PEMN—Physical Education for Men	PHIL—Philosophy	SOC—Sociology
PEW—Physical Education for Women	PHYS—Physics	SPAN—Spanish
PFT—Professional Foreman Technology	POL—Political Science	STAT—Statistics
	PSY—Psychology	THTR—Theater

School of Agriculture

TRAINING IN THE PROFESSIONAL PHASES of agriculture provides an opportunity to qualify for challenging and exciting careers. The pressure of population upon world supplies of food and fiber is evident. Modern food production, processing, and marketing are expanding rapidly. The stimulation and control of growth by biological and chemical means present complex problems. The use of natural resources for maximum benefit to society is a compelling necessity.

The opportunities for agricultural graduates trained in professional areas are expanding rapidly. In the decades ahead the demand for men and women with scientific training in agriculture will expand more rapidly than the increase in graduates. Industries related to agriculture need men and women who understand agriculture and are trained in business, communications, production, economics, education, and science.

Training in the School of Agriculture is based upon a solid foundation of mathematics, chemistry, biology, physics, economics, and English. Upon admission to the School of Agriculture, the student must meet with his adviser to develop a sequence of courses leading to a clearly defined program. Undergraduate plans of study are offered in the following areas:

Agricultural Communications—for students interested in communicating agriculture-related information through the four mass media—radio, television, film and journalism.

Agricultural Economics—prepares men and women for the business side of agriculture. Studies are concentrated in marketing, farm management, prices, statistics, and finance.

Agricultural Education—toward earning a license to teach vocational agriculture in high schools.

Agricultural Engineering—professional engineering training for service to rural communities and careers with agricultural equipment manufacturers.

Agricultural Mechanization—technical and academic preparation for careers in sales, service, and applications of the mechanized phases of agriculture and related businesses.

Agricultural Science—broad training in basic agricultural sciences. The curriculum is designed primarily for those who plan graduate studies in the life sciences.

- Agronomy**—specialization in plant genetics, crop production, and soil problems.
- Animal Sciences**—livestock breeding, animal nutrition, and management problems. Preparation for commercial fields allied to meat, poultry, and dairy products.
- Biochemistry**—preparation for careers with food, feed, fertilizer, and pharmaceutical industries related to the life sciences. Provides background for graduate work in biochemistry and plant and animal sciences.
- Community Development**—provides training to qualify the student to work with local communities, agencies, organizations, or groups involved in solving community problems; is interdisciplinary, integrating sociological-humanistic courses with agriculture.
- Conservation**—studies in recreation resource management, nature interpretation, and management of reservoirs, lands, and other plant and animal resources to prepare students for employment with state and federal agencies, conservation organizations, nature centers, and natural resource industries.
- Entomology**—training for careers in government and industry in sales, research, insect control, and insecticide regulation.
- Food Business Management**—is designed for the student with a primary interest in management and/or marketing positions in the nation's food processing and distribution firms.
- Food Science**—training to qualify for positions in the food industry. Strong science background emphasized in the curriculum.
- Forest Production**—broad training in fundamental concepts of professional forestry needed for enlightened management of nonagricultural lands.
- General Agriculture**—provides a wide choice of agricultural and other subjects as a background for individual objectives or a general agricultural education.
- Horticulture**—academic and technical training for careers in horticulture, food processing, and allied industries.
- International Agriculture**—students in any option may work with the International Advisory Committee and carry appropriate electives. Foreign experience is a possibility.
- Landscape Architecture**—training in design and planning for residential, industrial, and community landscaping.
- Management: Business and Farm**—training for managerial careers in agriculture-related industries.
- Meteorology**—emphasizes statistical and microclimatology to prepare students for careers in agricultural and forestry meteorology and graduate studies in the environment sciences.
- Natural Resources and Environmental Science**—a curriculum which faces the problems of environmental quality as it relates to human welfare; provides flexibility to develop individual study that will prepare the student to contribute to the solution of environmental problems.
- Plant Protection**—provides a comprehensive, organized treatment of the principles of plant protection and their application, including the proper use

of modern pesticides; prepares students for careers in agricultural chemical companies, agribusinesses, and federal and state regulatory agencies.

Preveterinary Science—a two-year program designed to meet requirements for admission to the Purdue School of Veterinary Science and Medicine.

Soil and Crop Science—preparation for technical phases of agronomy and for graduate studies in soils and plant genetics and nutrition leading to careers with government and industry.

Turf—training in plant and soil science and chemistry leading to careers with public and private golf courses, parks, and recreational areas.

Urban and Industrial Pest Control—specialization in controlling pests in homes and commercial facilities, for careers with industries, government agencies, and private businesses.

Wildlife Science—provides broad training in the foundations of wildlife ecology and management.

Wood Utilization—preparation for conversion, manufacture, and use of wood and wood fiber.

For a discussion of the various options, refer to the bulletin of the School of Agriculture. The first two years of most programs are offered at the North Central Campus.

REQUIRED FRESHMAN YEAR*

First Semester	Second Semester
(4) BIOL 108 (Introduction to Botany)	(4) BIOL 109 (Introduction to Zoology)
(3) CHM 111 (General Chemistry)	(3) CHM 112 (General Chemistry)
(3) ENGL 104 (English Composition I)	(3) ENGL 105 (English Composition II)
(3) MA 153 (Algebra and Trigonometry I)	(3) MA 154 (Algebra and Trigonometry II)
(3) Electives	(1) AGR 101 (Agricultural Lectures)
	(3) Elective
<hr/> (16)	<hr/> (17)

FRESHMAN ELECTIVES

Each student will select from the following group two subjects to be taken in his freshman year. His selections will provide the basis for his choice of optional groups in the sophomore, junior, and senior years. He should discuss his electives with the agricultural advisers at registration.

- (3) AGRY 105 (Crop Production)
- (3) ANSC 101 (Animal Agriculture)
- (3) AGECE 100 (Introductory Agricultural Business and Economics)
- (3) HORT 102 (Fundamentals of Horticulture)

* There are slight variations in the academic program for students following programs in agricultural science, biochemistry, food technology, preveterinary, wood utilization, forest production, conservation, and wildlife.

Schools of Engineering

UNDERGRADUATE INSTRUCTION in aeronautical engineering, agricultural engineering, chemical engineering, civil engineering, electrical engineering, engineering sciences, industrial engineering, mechanical engineering, materials science, metallurgical engineering, and the Division of Interdisciplinary Engineering Studies leads to the degree of Bachelor of Science.* In order to give the student sufficient time to adjust himself and to choose the branch of engineering for which he is best adapted, the following program of study during the freshman year is common for all engineering curricula. Only those students with adequate background training will be expected to accomplish this in two semesters. Students with inadequate preparation, particularly in mathematics and chemistry, may require an additional semester or summer session to attain sophomore standing.

COOPERATIVE PROGRAMS WITH INDUSTRY

Five-year cooperative education programs are available in all of the engineering disciplines. Students participating in these programs alternate periods of attendance at the University with periods of engineering experience in selected industries, government agencies, and consulting engineering firms.

While completing the requirements for an engineering degree, students gain a realistic concept of the challenge, working conditions, and rewards of being a member of the engineering profession.

Students planning a graduate program gain experiences with instrumentation and experimental techniques that are a valuable asset for later thesis work. Students often earn nearly all of their educational expenses while working for their cooperative employer.

Upon completion of the program, the students receive the regular Bachelor of Science degree and a certificate indicating their completion of the cooperative education program.

FRESHMAN ENGINEERING

The Department of Freshman Engineering administers the program of study which leads to admission into one of the Schools of Engineering. The freshman program of study in which the individual student is placed is

* Students who wish to become nuclear engineers are encouraged to enroll in the Division of Interdisciplinary Engineering Studies at the undergraduate level. The Department of Nuclear Engineering enrolls only graduate students, but some of the courses offered in nuclear engineering are available to undergraduate students.

The degree of Bachelor of Science in Engineering may be awarded to a student who acceptably carries out an interdisciplinary program which cuts across several of the traditional 'school' lines. These programs are administered by the Division of Interdisciplinary Engineering Studies.

The School of Materials Science and Metallurgical Engineering also offers special programs in materials science and engineering.

determined by the College Entrance Examination Board tests and school record data.

The freshman engineering program of study can be completed in one year. There are alternate programs of study available—some for the very well prepared, some for those less well prepared. Certain students have essentially completed their freshman requirements by their high school work, while others may require more than two semesters to prepare themselves for the professional engineering schools. Each beginning engineering student is advised individually by an engineering faculty counselor to insure that the student is properly placed in a program so that the student has a high probability of success. Prospective beginning engineering students are encouraged to visit the engineering faculty adviser at Purdue North Central as early as practicable in his junior or senior year in high school.

SOPHOMORE YEAR ENGINEERING PROGRAM

Since many of the Schools of Engineering require the same “core” courses in their undergraduate instruction, it is possible for those students who select the schools of Aeronautical, Agricultural, Civil, Industrial, or Mechanical Engineering, as well as Division of Interdisciplinary Engineering Studies to complete their sophomore year at Purdue North Central. Students in these programs wishing to graduate with a Bachelor of Science degree should plan to transfer to the West Lafayette Campus for the junior and senior years.

WOMEN STUDENTS IN ENGINEERING

With the many growing opportunities in private industry, research institutes, governmental agencies, and engineering education, it is anticipated that the number of women enrolled in engineering will grow to a size commensurate with the contributions that women can and will make to the growing status of our technological society. Purdue University's engineering faculty is both pleased and fortunate to have within its group several women engineering graduates. It is believed that in the near future more women will find a rewarding career in the challenging and interesting engineering field.

GENERAL EDUCATION PROGRAM

All engineering students are required to take a minimum of 24 credit hours of general education courses. Six credit hours are required in the freshman engineering program. These are ENGL 104 and COM 114. The remaining 18 credit hours must be selected from four groups of approved course sequences. These sequences are set up to give depth to the various programs in the social sciences, fine arts, and humanities. A pamphlet stating the objectives of the program in general education is available from the academic counselors.

Typical Freshman Program

(For those students fully qualified upon entrance)

FRESHMAN YEAR**First Semester**

- (4) CHM 115 (General Chemistry)
- (5) MA 163 (Plane Analytic Geometry and Calculus I)
- (3) COM 114 (Fundamentals of Speech Communication)
- (3) ENGL 104 (English Composition I)
- (2) EG 116 (Engineering Graphics I)

 (17)**Second Semester**

- (4) CHM 116 (General Chemistry)
- (5) MA 164 (Plane Analytic Geometry and Calculus II)
- (4) PHYS 152 (Mechanics)
- (3) CS 220 (Introduction to Algorithmic Processes)

 (16)**SOPHOMORE YEAR*****Third Semester**

- (4) MA 261 (Multivariate Calculus)
- (5) PHYS 251 (Heat, Electricity, Optics)
- (3) ESC 205 (Basic Mechanics I: Statics)
- (3) General education electives

 (15)**Fourth Semester**

- (4) MA 262 (Linear Algebra and Differential Equations)
- (3) ESC 206 (Basic Mechanics II: Dynamics)
- (3) ESC 223 (Mechanics of Materials)
- (6) General education electives

 (16)

School of Home Economics

THE PLAN OF STUDY in home economics is designed to prepare young men and women for professional work in the various areas of the field and at the same time to provide a broad general education which prepares the student to meet the needs for home and community living.

Areas of concentration include clothing and textiles, foods and nutrition, food management, foods in business, food research, home economics extension, housing, and vocational home economics teaching.

Students interested in preparation for work in the fields mentioned above should enroll in the curriculum which follows.

* Satisfies the requirements for the schools of Aeronautical, Agricultural, Civil, Industrial, and Mechanical Engineering, as well as the Division of Interdisciplinary Engineering Studies.

FRESHMAN YEAR

First Semester	Second Semester
(3) ENGL 104 (English Composition I)	(3) ENGL 105 (English Composition II)
(3) CHM 111 (General Chemistry)	(3) CHM 112 (General Chemistry)
(3) PSY 120 (Elementary Psychology)	(3) SOC 100 (Introductory Sociology)
(3) MA 123 (Elementary Concepts of Mathematics I)	(3) COM 114 (Fundamentals of Speech Communication)
(3) History or political science elective	(3) Elective
<hr/>	<hr/>
(15)	(15)

SOPHOMORE YEAR

Third Semester	Fourth Semester
(3) BIOL 203 (Biology of Man)	(3) BIOL 204 (Biology of Man)
(3) ECON 210 (Principles of Economics I)	(3) F&N 303 (Essentials of Nutrition)
(3) A&D 355 (Art Appreciation)	(3) PSY 235 (Child Psychology)
(3) Literature elective	(6-9) Electives
(3-6) Electives	
<hr/>	<hr/>
(15-18)	(15-18)

School of Humanities,
Social Science, and Education

REQUIREMENTS FOR GRADUATION

THE REQUIREMENTS FOR the baccalaureate degree are listed in the *General Information* bulletin of the University. One of these requirements is the certification by the dean of the appropriate school that the student has completed his plan of study.

Attainment of the objectives of the School of Humanities, Social Science, and Education is sought in two ways. One is through the specialized knowledge a student acquires as he majors or minors in one or more of the subjects offered by the departments in the school. The other is through the opportunity to gain skill and knowledge in other areas of learning through a combination of requirements and free electives.

DEGREES OFFERED

Three bachelor's degrees are offered in the School of Humanities, Social Science, and Education: Bachelor of Arts, Bachelor of Science, and the Bachelor of Physical Education (for men only).

The program leading to the degree of Bachelor of Arts is followed by students majoring in any of the fields of the humanities or the social sciences, in physical education for women, or in high school teaching in any of these fields. The program leading to the degree of Bachelor of Science is followed by students majoring in audiology and speech sciences and those majoring in psychological sciences. The program leading to the degree of Bachelor of Physical Education is followed by men students preparing for coaching and teaching, for admission to a school of physical therapy, or for athletic training.

BACHELOR OF ARTS OR BACHELOR OF SCIENCE

The plan of study for the Bachelor of Arts and the Bachelor of Science degrees in the School of Humanities, Social Science, and Education consists of (1) the general education requirements, (2) the requirements for the major (or "area" or "concentration"), and (3) a sufficient number of elective courses to bring the total credits to 120. All credits must have been earned within the ten years preceding the date of graduation.

GENERAL EDUCATION REQUIREMENTS

The general education requirements specify a minimum involvement in several areas. They have been established in order to insure that each student has the opportunity to acquire skill in the oral and written use of his own language, in at least one other modern language, and in mathematics, and that he has had a significant experience in the field of science, in the arts, in the humanities, and in the social sciences.

Areas	Hours
English Composition (ENGL 101-102, or 103)	3 or 4
Interpersonal Communication (Speech) (COM 114)	0 or 3
Foreign Language (Courses 203 and 204, or proficiency in 204) or courses in a foreign culture.	6
Mathematics or Logic (MA 151, or two semesters of mathematics, or two semesters of logic)	5 or 6
Freshman Issues (GS 101)	3
Humanities	12

Twelve hours, not more than six hours in one *area*, not more than six hours in one department.

The *areas* are *aesthetics*, *history*, *literature*, and *philosophy*. The approved courses in those *areas* are *aesthetics*: A&D 101-102, 355, 356, 357, 358, 359, 381, 382, 383, 390, 450, 451, 452, 458; MUS 250, 372, 373, 375; ENGL 376, 405; THTR 201; PEW 110 (Folk, Square, and Modern Dance; Gymnastics; Synchronized Swimming; Fencing; Stunts and Tumbling), 140, 141; COM 240, 340, 341, 342. *History*: HIST

(Continued)

200, 201, 251, 252, any other. *Literature*: ENGL 230, 231, 235, 237, 238, 240, 241, 350, 351, 442, 460, 461, 462, 463, 464, 471, 472, 479; ML, any foreign language literature course; COM 312, 313, 513, 514, 517, 519. *Philosophy*: Any course except logic (observe prerequisites).

Social Sciences 6

Any two courses, chosen from: ECON 185, 210 or 219, 212; IM 200, 430, 431, 445, 455; POL 101, 103, 230, 300, 301, 321, 350, any course in POL; PSY 120, any course in PSY (observe prerequisites); SOC 100 or 312; ANTH 105, 304; any course in SOC or in ANTH (observe prerequisites).

Natural Science 6

A six-hour set of courses in biology, chemistry, geosciences, or physics

Total of core requirements 41-46 hours

Minimum required for graduation 120 hours

CONCENTRATION REQUIREMENTS

There are three patterns of concentration: (1) the *area* (maximum of 45 hours, of which at least 12 are in courses outside the major department), (2) the *concentration* (36 to 45 hours), and (3) the *major* (24 to 35 hours). Each department specifies whether its major must be accompanied by a minor. This major, concentration, or area provides the depth necessary for admission to a graduate school, to meet teacher certification requirements, or for a well-rounded liberal education.

Each student must file his choice of major, area, or concentration at the office of the dean, not later than the end of the third semester. He may subsequently change his major, with permission of the dean.

**B.A. AND B.S. DEGREES
AREAS, CONCENTRATIONS, AND MAJORS**

Audiology and Speech Sciences	Interior Design
Audiology and Speech Sciences	Visual Design
Speech and Hearing Therapy	(Advertising Design)
Child Development and Family Life	Music History
Human Development	Theatre (Acting, Design, Directing)
Communication	English
Journalism	American Literature
Radio-Television	Creative Writing
Speech Communication	English Honors
General Speech	English Literature
Creative Arts	Foreign Language
Art History	French
Fine Arts	German
Industrial Design	Russian
	Spanish

(Continued)

**B.A. AND B.S. DEGREES
AREAS, CONCENTRATION, AND MAJORS**

History	Physical Education (Women)
American Civilization	Research
American History	Recreation
European History	Political Science
Library Science	Psychological Sciences
Philosophy	Science and Culture
Physical Education, Health, and Recreation	Sociology
Health and Safety	Anthropology
	Sociology

MINORS

Anthropology	Physical Education (Women)
Audiology and Speech Sciences	Political Science
Economics	Psychological Sciences
French	Radio and Television
German	Recreation
Health and Safety	Russian
History	Sociology
Journalism	Spanish
Library Science	Speech Communication
Literature	Speech Communication, History of
Mathematics	Speech, General
Music History and Theory	Theatre
Philosophy	

PROGRAMS FOR TEACHER CERTIFICATION

Teaching Area Majors

Arts and Crafts

Physical Education and Health
(Women)

Teaching Majors

Arts and Crafts

Health and Safety

Elementary Education

Physical Education and Health
(Women)

Foreign Language

Junior High School

School Library and Audiovisual
Services

Library

Nursery-Kindergarten

Social Studies—two of:

Physical Education (Men)

Economics

Speech and Hearing Therapy

Government

English

Sociology

Foreign Language

U.S. History

French

World History

German

Speech (Interpersonal Communica-
tion)

Russian

Speech and Hearing Therapy

Spanish

Teaching Minors

Arts and Crafts

Physics

Biology

Psychology

Chemistry

Recreation

English

School Library and Audiovisual
Services

Foreign Language

Social Studies—one of:

French

Economics

German

Government

Russian

Sociology

Spanish

U.S. History

General Science

World History

Health and Safety

Special Education

Mathematics

Speech (Interpersonal Communication)

Physical Education (Men)

Physical Education (Women)

In teacher preparation, Purdue University has been accredited by the National Commission on Accreditation of Teacher Education, by the North Central Association of Secondary Schools and Colleges, and by the Indiana State Department of Public Instruction. Detailed requirements for any of the areas, majors, or minors may be obtained from the student counseling office of the school. A student who has an educational objective not covered in the list of areas, majors, or minors should consult the director of counseling.

Each student's program for the four years will be based on one of several plans of study, appropriately modified to fit his concentration requirements and his exemptions, i.e., proficiency in modern language, ENGL 103, etc.

Students who plan to teach in high school will use the plan of study for the major subject-matter field of the teaching certificate for which they expect to qualify.

ELEMENTARY EDUCATION

Preparation in elementary education is offered to a limited number of students chosen on the basis of above-average scholarship, leadership qualities, good mental and physical health, and positive attitude toward children and teaching as a profession. In addition to the core program of all students and the professional program in elementary education, the student will have 24 semester hours for a major in the field of his choice or a program of directed electives.

BACHELOR OF PHYSICAL EDUCATION,

The plan of study for the degree Bachelor of Physical Education for men only consists of:

1. Completion of specific course requirements in the selected curriculum within the two general options, A and B.
2. Completion of at least ten semester hours, with required graduation index, within the ten years preceding the date of graduation.

During the freshman year, a program common to all possible choices, the student selects his option under guidance of his assigned counselor.

Option A—Teaching Option. Within the option, a student may elect coaching with any of a dozen teaching minors, prephysical therapy, athletic training, special education, or any of several other related areas.

Option B—Nonteaching Option. Within this option, a student may elect a second area of specialty according to his interests and needs. Among the possible second areas are sales, sportscasting, sportswriting, social work, and pre-physical therapy.

School of Industrial Management

INDUSTRIAL MANAGEMENT

AS MODERN SOCIETY makes increasing use of technology, managers must keep informed to handle their own jobs effectively and to be able to understand and cooperate with the technical specialist. The industrial management curriculum, by including a required technical sequence, enables the student to take advantage of Purdue's excellent resources in science and technology. Through the technical option, students are provided an opportunity to acquire a basic understanding of a specific area in the field of science and technology. Such an objective is essential if the individual is to be capable of working effectively with engineers and scientists in a technically-based industry.

Included in the curriculum is a concentration of mathematics and quantitative methods courses designed to provide the necessary training and background in the use of rigorous analytic techniques applicable to management decisions.

This program is designed to help the student develop this kind of broad understanding of the management process.

An administrator cannot be made in the short span of a few months or year. Indeed, most individuals require years of experience to develop the skills, insights, and maturity of judgment which distinguish an effective manager. However, a professional management curriculum can give the student an effective start in his development as a manager. In brief, it can help him become a more useful member of his organization early in his career, and it can aid him in learning and growing more rapidly in positions of increasing responsibility.

Industrial Management

FRESHMAN YEAR

First Semester	Second Semester
(4) Chemistry or physics	(4) Chemistry or physics
(3) COM 114 (Fundamentals of Speech Communication)	(3) ECON 210 (Principles of Economics)
(3) ENGL 104 (English Composition I)	(3) ENGL 105 (English Composition II)
(5) MA 163 (Plane Analytic Geometry and Calculus I)	(3) General education group 1 elective*
	(5) MA 164 (Plane Analytic Geometry and Calculus II)
<hr/> (15)	<hr/> (18)

SOPHOMORE YEAR

Third Semester	Fourth Semester
(3) CS 220 (Introduction to Algorithmic Processes)	(3) ECON 252 (Macrofinance)
(3) ECON 251 (Microeconomics)	(3) General education group 2 elective*
(3) General education group 1 elective*	(3) INDM 201 (Cost Accounting)
(3) INDM 200 (Introductory Accounting)	(3) Technical option 1†
(4) MA 261 (Multivariate Calculus)	(3) Elective
<hr/> (16)	<hr/> (15)

* General education requirements consist of: group 1—one two-course sequence; group 2—one course in each of two other areas. The areas for selection are English literature, history, philosophy, political science, psychology, and sociology.

† For the technical option, a minimum of 15 hours is necessary. Technical option areas are: computer sciences, economics, engineering, quantitative methods or science (biology, chemistry, geology, mathematics, physics).

General Management

FRESHMAN YEAR

First Semester	Second Semester
(3) COM 114 (Fundamentals of Speech Communication)	(3) ECON 210 (Principles of Economics)
(3) ENGL 104 (English Composition I)	(3) ENGL 105 (English Composition II)
(3) General education group 1 elective*	(3) General education group 1 elective*
(3) Lab science I elective†	(3) Lab science II elective†
(3) MA 153 (Algebra and Trigonometry I)	(3) MA 154 (Algebra and Trigonometry II)
<hr/> (15)	<hr/> (15)

SOPHOMORE YEAR

Third Semester	Fourth Semester
(3) CS 220 (Introduction to Algorithmic Processes)	(3) ECON 252 (Macrofinance)
(3) ECON 251 (Microeconomics)	(3) General education group 1 elective*
(3) General education group 1 elective*	(3) General education group 2 elective*
(3) INDM 200 (Introductory Accounting)	(3) INDM 201 (Cost Accounting)
(3) MA 213 (Finite Mathematics I)	(3) MA 214 (Finite Mathematics II)
(1-2) Elective	(1-2) Elective
<hr/> (16-17)	<hr/> (16-17)

ECONOMICS

In contrast to the technically-based internal approach utilized in the management program, the economics curriculum provides a coordinated series of courses in the field of economics and business as a means of developing a broad fundamental background in business organizations and the economic environment in which a business operates. The program includes four two-semester sequences covering economic principles, aggregate economics, statistics, and accounting, plus courses in business law and managerial economics. In addition, three related courses in economics and business of special interest to the student make possible a degree of specialization. Elective hours permit

* General education requirements consist of: group 1—one four-course sequence (not general studies, fine arts, or anthropology); group 2—two two-course sequences (to include psychology unless selected above); and group 4—one course in one other area. The areas for selection are American history, anthropology, English literature, fine arts, general studies, modern language, philosophy, political science, psychology, sociology, world history, world literature.

† Completion of any two semesters (six hours minimum) in the following subjects; biology, chemistry, geosciences, or physics.

either further concentration in economics or enrichment in the general education area.

Business leaders, employment officials, and schools for advanced study, such as law schools, have endorsed this type of economics and business education with liberal arts background. The program satisfies the need of future junior business executives for a broad, liberal-arts-oriented base on which to build specific training and experience received on the job.

Economics

FRESHMAN YEAR

First Semester	Second Semester
(3) COM 114 (Fundamentals of Speech Communication)	(3) ECON 210 (Principles of Economics)
(3) ENGL 104 (English Composition I)	(3) ENGL 105 (English Composition II)
(3) General education group 1 elective*	(3) General education group 1 elective*
(3) Lab science II elective†	(3) Lab science II elective†
(5) MA 163 (Plane Analytic Geometry and Calculus I) or	(5) MA 164 (Plane Analytic Geometry and Calculus II) or
(3) MA 213 (Finite Mathematics I) or	(3) MA 214 (Finite Mathematics II)
(5) MA 151 (Algebra and Trigonometry)‡	(0-3) Elective
(0-3) Elective	
<hr/> (15-20)	<hr/> (15-20)

SOPHOMORE YEAR

Third Semester	Fourth Semester
(3) CS 220 (Laboratory on Algorithmic Processes)	(3) ECON 252 (Macrofinance)
(3) ECON 251 (Microeconomics)	(3) MA 214 (Finite Mathematics II) or
(3) General education group 1 elective*	MA 224 (Introductory Analysis II)
(3) INDM 200 (Introductory Accounting)	(3) General education group 1 elective*
(3) MA 213 (Finite Mathematics I) or	(3) General education group 2 elective*
MA 223 (Introductory Analysis I)	(1-2) Electives
(1-2) Electives	
<hr/> (16-17)	<hr/> (13-14)

* General education requirements consist of: group 1—one four-course sequence (not general studies, fine arts, or anthropology); group 2—two two-course sequences (to include psychology unless selected above). The areas for selection are American history, anthropology, English literature, fine arts, general studies, modern languages, philosophy, political science, psychology, sociology, world history, world literature.

† Completion of any two semesters (six hours minimum) in the following subject: biology, chemistry, geosciences, or physics.

‡ MA 151 is acceptable toward the degree requirements.

School of Science

THE SCHOOL OF SCIENCE consists of the departments of Biological Sciences, Chemistry, Physics, Computer Sciences, Statistics, Geosciences, and the Division of Mathematical Sciences.

The School of Science offers a broad training which prepares students for a variety of careers.

Curricula leading to two degrees, Bachelor of Science and Bachelor of Science in Chemistry, are offered by the School of Science.

Specific details of these curricula and the requirements for the degrees are listed in the School of Science catalog.

BACHELOR OF SCIENCE DEGREE

General Education Requirements

The following general requirements for the B.S. degree in the School of Science are supplemented by requirements of the department of the student's major. Particular attention is drawn to modification allowed in the curricula for prospective high school teachers (as indicated below).

1. A total of 124 semester hours: An average of $15\frac{1}{2}$ hours per semester is sufficient to accumulate 124 hours in eight semesters. Students with a graduation index less than 5.0 are advised not to take more than 17 hours in any one semester.
2. English composition: One year of English composition, or ENGL 103 entered by achievement examination and completed with a grade of C or better.
3. Modern foreign language: Pass a fourth-semester college-level course in a modern foreign language, or pass an equivalent proficiency examination. In high school teaching curricula, the student must pass a second-semester college-level course in a modern foreign language or pass a proficiency examination.
4. Humanities, social science, and behavioral sciences: The minimum requirement is 18 hours, but it is strongly recommended that the student take more than a minimal program. Six hours must be chosen from each of two of the following areas: (a) literature, philosophy; (b) history, political science; and (c) economics, sociology, psychology. In addition, a satisfactory two-course sequence must be chosen from one of the above areas.
5. Mathematics: At least 11 hours.
6. Science: Each student must take at least four courses in laboratory science (biology, chemistry, geology, physics) *outside his major area*. It is preferable that he take two-course sequences in each of two sciences; in no case shall he satisfy this requirement by courses drawn from more than two sciences.

BIOLOGICAL SCIENCES

The Department of Biological Sciences offers four programs leading to the Bachelor of Science degree. These are:

1. **Biological Sciences Program.** This program is designed for students interested in any of the areas of basic biology. By choosing an appropriate plan of study within this program a student can specialize in botany, microbiology, zoology, or general biology (including biophysics), either with the B.S. as a terminal degree or in preparation for graduate work.
2. **Premedical and Predental Program.** The plans of study in this program differ from those in the preceding program only in requiring fewer credits in biology and in providing an opportunity for some students to fulfill their requirements for the B.S. by taking all required courses (99 to 103 credits, depending on chemistry and mathematics sequences selected) in six semesters and then completing the first year at an accredited medical or dental school.
3. **Medical Technology Program.** The plans of study in this program include six semesters of work (96 credit hours) at Purdue University followed by a full year of work at an approved school of medical technology and a successful Board of Registry examination.
4. **Biology Teaching Program.** The plans of study in this program are designed for prospective high school teachers in biology. Such students should note that, in addition to meeting the requirements for the degree, it is essential for them to complete the requirements for certification imposed by the state in which they expect to teach.

Each program consists of (1) the core courses in biology; (2) certain specified courses in chemistry, physics, and mathematics; (3) in some cases, additional elective courses in biology; (4) the School of Science course requirements; and (5) for prospective teachers, certain education courses. In the medical technology program, three of the core biology courses are replaced by other courses in biology, one of which must be animal physiology. The first two years of each program are offered at the North Central Campus.

Biological Sciences, Premedicine, Predentistry, Medical Technology, and Biological Teaching

FRESHMAN YEAR

First Semester	Second Semester
(3) BIOL 103 (Principles of Biology)	(3) BIOL 104 (Principles of Biology)
(4) CHM 115 (General Chemistry)	(4) CHM 116 (General Chemistry)
(3) ENGL 104 (English Composition I)	(3) ENGL 105 (English Composition II)
(3) MA 223 (Introductory Analysis I) or	(3) MA 224 (Introductory Analysis II) or
(5) MA 163 (Integrated Calculus and Analytic Geometry I)	(5) MA 164 (Integrated Calculus and Analytic Geometry II)
(3) Modern language	(3) Modern language
<hr/> (16-18)	<hr/> (16-18)

CHEMISTRY

Students electing chemistry as a major may select either of two degree programs, depending upon their interest. These are:

Bachelor of Science in Chemistry Degree

This degree program is designed primarily for students planning to go on to graduate study or preparing for an industrial career as a chemist. It is planned to fulfill the recommendations of the Committee on Professional Training of the American Chemical Society; graduates who follow this program will be certified to the American Chemical Society as having fulfilled recommended requirements.

Students wishing to graduate with the Bachelor of Science in Chemistry should plan to transfer to the West Lafayette Campus for their sophomore and subsequent years.

Bachelor of Science Degree (Chemistry major or chemistry teaching major)

This degree program contains the same basic courses in chemistry as the B.S. in Chemistry degree program but has fewer requirements and thus permits more electives from other areas. It is recommended that students build a program of study from another area to complement this basic but minimal chemistry program. It is particularly suited for students preparing for careers as chemistry teachers, geochemists, biologists, medical doctors, scientific librarians, science writers, chemical salesmen, chemical patent attorneys, or other careers which require a less highly specialized training in chemistry than is offered for the B.S. in Chemistry degree.

The chemistry, mathematics, and physics courses in this degree program meet the Indiana certification requirements for a secondary-school teaching major in chemistry.

FRESHMAN YEAR

First Semester

- (5) CHM 115 (General Chemistry)
- (5) MA 163 (Integrated Calculus and Analytic Geometry I)
- (3) ENGL 104 (English Composition I)
- (3) GER 101 (First Course in German)

(16)

Second Semester

- (5) CHM 116 (General Chemistry)
- (5) MA 164 (Integrated Calculus and Analytic Geometry II)
- (3) ENGL 105 (English Composition II)
- (3) GER 102 (Second Course in German)

(16)

SOPHOMORE YEAR

Third Semester		Fourth Semester	
(3)	CHM 255 (Organic Chemistry)	(3)	CHM 256 (Organic Chemistry)
(2)	CHM 255L (Organic Chemistry Laboratory)	(2)	CHM 256L (Organic Chemistry Laboratory)
(4)	MA 261 (Multivariate Calculus)	(4)	MA 262 (Linear Algebra and Differential Equations)
(4)	PHYS 152 (Mechanics)	(5)	PHYS 251 (Heat, Electricity, and Optics)
(3)	GER 203 (Third Course in German)	(3)	GER 244 (Fourth Course in Scientific German)
<hr/>		<hr/>	
(16)		(17)	

MATHEMATICS

FRESHMAN YEAR

First Semester		Second Semester	
(5)	MA 163 (Plane Analytic Geometry and Calculus I)	(5)	MA 164 (Plane Analytic Geometry and Calculus II)
(3)	ENGL 104 (English Composition I)	(3)	ENGL 105 (English Composition II)
(3)	Modern language (German preferred)	(3)	Modern language
(4)	Science elective	(4)	Science elective
(3)	Elective	(3)	Elective
<hr/>		<hr/>	
(18)		(18)	

SOPHOMORE YEAR

Third Semester		Fourth Semester	
(4)	MA 261 (Multivariate Calculus)	(3)	MA 351 (Elementary Linear Algebra)
(3)	Modern language	(3)	Modern language
(4)	Science elective	(4)	Science elective
(6)	Humanities electives	(3)	MA 361 (Advanced Calculus and Differential Equations)
		(3)	Elective
<hr/>		<hr/>	
(17)		(16)	

PHYSICS

FRESHMAN YEAR

First Semester		Second Semester	
(3)	ENGL 104 (English Composition I)	(4)	CHM 116 (General Chemistry)
(4)	CHM 115 (General Chemistry)	(5)	MA 164 (Integrated Analytic Geometry and Calculus II)
(5)	MA 163 (Integrated Analytic Geometry and Calculus I)	(4)	PHYS 152 (Mechanics)
(3)	Modern language	(3)	Modern language
<hr/>		<hr/>	
(15)		(16)	

SOPHOMORE YEAR

Third Semester	Fourth Semester
(4) MA 261 (Multivariate Calculus)	(4) MA 262 (Linear Algebra and Differential Equations)
(5) PHYS 251 (Heat, Electricity, and Optics)	(3) PHYS 342 (Modern Physics)
(3) ENGL 105 (English Composition II)	(3) Modern language
(3) Modern language	(6) Electives
<hr/> (15)	<hr/> (16)

PREPHARMACY

Students wishing to prepare for the profession of pharmacy may complete one or two years on this campus registered in the School of Science. Application for transfer to the School of Pharmacy and Pharmacal Sciences (West Lafayette Campus) should be filed with the prepharmacy adviser *before February 14 of the final spring semester on this campus*. Students who, for any reason, do not transfer to the School of Pharmacy and Pharmacal Sciences may apply for transfer to any other school of the University or remain in the School of Science, with a change of educational objective.

ELECTIVES

Fifteen credit hours must be selected from two general areas of study: (1) humanities and (2) social studies and behavioral sciences. A minimum of six credit hours must be taken in each area. The 15 elective credit hours must be completed during the first six semesters. ECON 210 shall be counted toward the satisfaction of this requirement. Departments and courses which will meet the requirement for these restricted electives are the following:

Humanities	Social Studies and Behavioral Sciences
Communication (all courses numbered 160 and above)	Economics (all courses)
Creative Arts (all courses)	History (all courses)
English (all courses numbered 200 and above)	Political Science (all courses)
Modern Languages (all courses)	Sociology (all courses)
Philosophy (all courses)	

FRESHMAN YEAR

First Semester	Second Semester
(3) MA 153 (Algebra and Trigonome- try I)*	(3) MA 154 (Algebra and Trigonome- try II)*
(4) CHM 115 (General Chemistry)	(4) CHM 116 (General Chemistry)
(3) Elective	(3) ENGL 105 (English Composition II)
(3) ENGL 104 (English Composition I)	(3) BIOL 109 (Introduction to Zool- ogy)
(3) BIOL 103 (Principles of Biology)	(3) Elective
<hr/> (16)	<hr/> (16)

* MA 151 or a higher level mathematics course may be substituted for MA 153 and MA 154.

School of Technology

THE APPLIED SCIENCES

THE UNIVERSITY has a number of two-year undergraduate programs leading to the degree of Associate in Applied Science.

The associate degree is awarded to each student who satisfactorily completes the program of study in one of the curricula. Graduates can expect to be immediately employable in industry. Those who have received the associate degree may be admitted to the two-year curricula designed to lead to a Bachelor of Science degree in technology, industrial education, or industrial supervision.

ASSOCIATE IN APPLIED SCIENCE DEGREE

The Nature of Applied Science

Scientific and technological complexity ranges over a broad spectrum, from extremely simple to highly complex and abstract activity. At one extreme are the pure scientist and the engineering scientist; at the other, the mechanic, the craftsman, and the service personnel.

The Engineer. The 37th Annual Report of the Engineering Council for Professional Development, September 30, 1969 defines engineering as "the profession in which a knowledge of the mathematical and natural sciences gained by study, experience, and practice is applied with judgment to develop ways to utilize, economically, the materials and forces of nature for the benefit of mankind."

The Engineering Technician. The National Society for Professional Engineers has approved this definition of the engineering technician provided by the Board of the Institute for the Certification of Engineering Technicians:

"An engineering technician is one who, in support of and under the direction of professional engineers or scientists, can carry out in a responsible manner either proven techniques which are common knowledge among those who are technically expert in a particular technology, or those techniques especially prescribed by professional engineers.

"Performance as an engineering technician requires the application of principles, methods, and techniques appropriate to a field of technology, combined with practical knowledge of the construction, application, properties, operation, and limitations of engineering systems, processes, structures, machinery, devices, or materials, and, as required, related manual crafts, instrumental, mathematical, or graphic skills.

"Under professional direction an engineering technician analyzes and solves technological problems, prepares formal reports on experiments, tests, and other similar projects or carries out functions such as drafting, surveying, technical sales, advising consumers, technical writing, teaching, or training. An engineering technician need not have an education equivalent in type, scope, and rigor to that required of an engineer; however, he must have a more theoretical education with greater mathematical depth, and experience over a

broader field than is required of skilled craftsmen who often work under supervision."

The Skilled Craftsman. The work of the engineer and the technician would be meaningless without the contribution of the skilled craftsman who carries out engineering ideas. A toolmaker, for example, fabricates a jig or die from a design conceived by the engineer and detailed by the technician. The electrician, pipefitter, welder, machinist, chemical operator, and surveyor's rodman likewise use their skills to carry out the work of the engineering team.

Need. Since it now appears improbable that our nation will be able to attain the goal of 70,000 to 80,000 engineers per year, another approach to the problem is necessary. The most reasonable solution appears to be one of making the present professional engineer more efficient by providing him with assistance in the form of an engineering technician. Many experts believe that there should be a ratio of from three to five engineering technicians for each engineer. This would indicate that 100,000 to 150,000 engineering technicians should be trained per year.

Currently the United States has only about 16,000 graduates of engineering technology programs coming on the job market each year. This simply means there is a large, unsatisfied demand for engineering technicians. The opportunities in this field are virtually unlimited.

Developed With Industrial Cooperation

Various courses are offered to cover the basic knowledge and practices of present-day industry. Industrial leaders have been consulted to learn the kind of specific technical information required by persons who take jobs in industry. Many members of the instructional staff are drawn from local industries, but course administration, teaching material, and standards of instruction are under the direction of the departments involved.

ARCHITECTURAL TECHNOLOGY

This curriculum is designed to prepare students for technological employment with contractors, building materials suppliers, architects, civil engineers, and related governmental agencies.

Emphasis is placed on construction materials and processes, specifications, regulations, estimating, surveying, frame and masonry construction, and architectural and structural drafting, as well as on related courses in mathematics and physical science.

Also included are courses dealing with some of the historical, economic, and human relations aspects related to the individual in our American industrial life.

Graduates are prepared to accept positions as estimators, expeditors, planning technicians, field inspectors, architectural detailers, architectural draftsmen, and sales representatives.

Graduates may also continue their education by pursuing a Bachelor of Science degree with a major in construction technology.

FRESHMAN YEAR

First Semester	Second Semester
(3) EG 110 (Drafting Fundamentals)	(2) ART 120 (Freehand Drawing I)
(2) ART 164 (Building Materials)	(3) ART 150 (Architectural Construction I)
(3) CET 104 (Elementary Surveying)	(2) ART 172 (Systems of Construction)
(3) MA 147 (Algebra and Trigonometry for Technology I)	(3) CET 160 (Statics)
(3) ENGL 104 (English Composition I)	(3) MA 148 (Algebra and Trigonometry for Technology II)
(3) Social science elective	(3) COM 114 (Fundamentals of Speech Communication)
<hr/> (17)	<hr/> (16)

SOPHOMORE YEAR

Third Semester	Fourth Semester
(2) ART 220 (Freehand Drawing II)	(3) ART 224 (Architectural Construction I)
(3) ART 222 (Architectural Construction II)	(2) ART 285 (Electricity for Buildings)
(2) ART 276 (Specifications and Contract Documents)	(3) CET 266 (Materials Testing)
(3) ART 284 (Mechanical Equipment for Buildings)	(3) CNT 280 (Quantity Survey and Estimating)
(3) CET 260 (Strength of Materials)	(3) ART 210 (History of Architecture I) or Nontechnical elective
(4) PHYS 220 (General Physics)	(3) Business elective
<hr/> (17)	<hr/> (17)

CIVIL ENGINEERING TECHNOLOGY

This program is designed to prepare students for employment with land surveyors, highway departments, contractors, city engineering offices, railroads, and engineering consultants, as well as in other specializations of civil engineering technology.

Graduates of this program accept positions as technicians in the offices of contractors, city engineers, and professional engineers; as topographers, structural draftsmen, and steel and concrete laboratory techniques; and as instrument men with land surveys, property surveys, and highway surveys. With additional experience students may acquire positions as supervisors, or chiefs of parties, in a variety of work associated with civil engineering.

Graduates may also continue their education by pursuing a Bachelor of Science degree with a major in construction technology.

FRESHMAN YEAR

First Semester	Second Semester
(3) CET 104 (Elementary Surveying)	(3) CET 108 (Route Surveying and Design)
(3) EG 110 (Drafting Fundamentals)	(3) CET 160 (Statics)
(2) ART 164 (Building Materials)	(3) ART 150 (Architectural Construction I)
(5) MA 150 (Mathematics for Technology)*	(3) MA 221 (Calculus for Technology I)
(3) ENGL 104 (English Composition I)	(3) COM 114 (Fundamentals of Speech Communication)
<hr/>	<hr/>
(16)	(15)

SOPHOMORE YEAR

Third Semester	Fourth Semester
(3) CET 209 (Land Surveying and Subdivision)	(3) CET 266 (Materials Testing)
(3) CET 253 (Hydraulics and Drainage)	(3) CNT 280 (Quantity Survey and Estimating)
(3) CET 260 (Strength of Materials)	(3) Structural elective
(2) ART 276 (Specifications and Contract Documents)	(3) Mathematics/science elective
(4) PHYS 220 (General Physics)	(3) Business elective
(3) Social science elective	(3) Nontechnical elective
<hr/>	<hr/>
(18)	(18)

COMPUTER TECHNOLOGY

This two-year associate degree program is designed to produce a graduate competent in computer programming in either the commercial or technical area, depending on which of the two options is selected. It prepares a person to perform the following functions: analyze problems, design flowcharts, write computer programs, verify programs, and evaluate and modify existing programs. It also familiarizes him with procedures common in his area of specialization.

Graduates may continue their education by pursuing a Bachelor of Science degree with a major in computer technology.

* A student whose program requires MA 150 and who does not qualify, as indicated by the placement tests in algebra and trigonometry and high school grades, will be assigned to a four-semester sequence: MA 147, 148, 221, and 222. Thus it is strongly urged that he complete MA 111 or equivalent in the summer session preceding entrance into full-time study. Otherwise, the student may require five semesters to complete his program.

Commercial Option**FRESHMAN YEAR**

First Semester		Second Semester	
(5)	CPT 115 (Introduction to Data Processing)	(3)	CPT 122 (Computer Mathematics)
(1)	ENGL 185 (Developmental Reading)	(4)	CPT 133 (Assembly Language Programming I)
(5)	MA 150 (Mathematics for Technology)*	(3)	ENGL 104 (English Composition I)
(3)	COM 114 (Fundamentals of Speech Communications)	(3)	INDM 200 (Introductory Accounting)
(3)	IET 104 (Industrial Organization)	(3)	CPT 261 (RPG Programming)
		(3)	Elective
<hr/> (17)		<hr/> (19)	

SOPHOMORE YEAR

Third Semester		Fourth Semester	
(4)	CPT 134 (Assembly Language Programming II)	(3)	CPT 265 (COBOL Programming)
(3)	CPT 225 (Statistical Methods)	(3)	CPT 286 (Computer Operating Systems I)
(3)	CPT 254 (Commercial Systems Applications)	(1)	CPT 294 (Computer Seminar and Field Trips)
(3)	CPT 264 (Fortran Programming)	(3)	ECON 210 (Principles of Economics)
(3)	INDM 201 (Cost Accounting)	(3)	GNT 220 (Technical Report Writing)
		(3)	Elective
<hr/> (16)		<hr/> (16)	

Technical Option**FRESHMAN YEAR**

First Semester		Second Semester	
(5)	CPT 115 (Introduction to Data Processing)	(3)	CPT 122 (Computer Math)
(1)	ENGL 185 (Developmental Reading)	(4)	CPT 133 (Assembly Language Programming I)
(5)	MA 150 (Mathematics for Technology)*	(3)	ENGL 104 (English Composition I)
(3)	COM 114 (Fundamentals of Speech Communication)	(4)	PHYS 220 (General Physics)
(3)	IET 104 (Industrial Organization)	(3)	Elective
<hr/> (17)		<hr/> (17)	

* See footnote regarding mathematics course, p. 45.

SOPHOMORE YEAR

Third Semester	Fourth Semester
(4) CPT 134 (Assembly Language Programming II)	(3) CPT 220 (Numerical Methods I)
(3) CPT 225 (Statistical Methods)	(1) CPT 294 (Computer Seminar and Field Trips)
(3) CPT 264 (Fortran Programming)	(3) ECON 210 (Principles of Economics)
(3) MA 221 (Calculus for Technology I)*	(3) GNT 220 (Technical Report Writing)
(4) PHYS 221 (General Physics)	(3) MA 222 (Calculus for Technology II)
	(3) CPT 261 (RPG Programming)
	or
	CPT 286 (Computer Operating Systems I)
<hr/> (17)	<hr/> (16)

ELECTRICAL ENGINEERING TECHNOLOGY

The electrical engineering technology program is a combination of courses in electrical engineering technology, mathematics, science, and general academic subjects that leads to the degree of Associate in Applied Science. The program is designed to prepare students for employment as electronic technicians in research laboratories, electronic industries, and in any industry that uses electrical power or electronic controls.

The basic curriculum will provide the student with sufficient education to find employment in the fields of communications electronics, industrial electronics, microwaves, military electronics, computer electronics, automation, electronic servicing, television, electrical power, aviation electronics, and others. Specialization in these areas is provided by technical elective courses in the second year of the program.

The duties of the electronic technician could be: construction, testing, and troubleshooting of experimental circuits in research laboratories; installation, maintenance, troubleshooting, operation, and testing of electrical and electronic equipment in industries; sales and service of electronic equipment, etc.

Electronic technicians have the following job classifications: research or laboratory technician, electronics engineering technician, engineering development technician, product design technician, systems test technician, field service technician, production technician, maintenance technician, instrument technician, inspectors, electronic specialist, radio operator, and many others.

After experience and continued technician growth, graduates hold such positions as junior engineer, sales engineer, field engineer, customer service engineer, applications engineer, supervisor, manager, foreman, contractor, electrical estimator, broadcast engineer, etc.

Students who obtain the degree of Associate in Applied Science are eligible for consideration for admission to curricula leading to the degree of Bachelor

* Superior students with adequate preparation may take MA 163 or other equivalent mathematic courses as a substitute for this required course.

of Science. Approximately two additional years of study are necessary to complete the requirements for this degree.

FRESHMAN YEAR

First Semester	Second Semester
(2) EET 103 (Electronics I: Vacuum Tubes and Transistors)	(3) EET 153 (Electronics II)
(3) EET 101 (Electrical Circuits I)	(3) EET 151 (Electrical Circuits II)
(2) EET 113 (Electrical Engineering Technology Laboratory I)	(2) EET 163 (Electrical Engineering Technology Laboratory II)
(5) MA 150 (Mathematics for Technology)*	(4) PHYS 220 (General Physics)
(3) ENGL 104 (English Composition I)	(3) MA 223 (Introductory Analysis I)
(3) Nontechnical elective	(3) COM 114 (Fundamentals of Speech Communication)
<hr/>	<hr/>
(18)	(18)

SOPHOMORE YEAR

Third Semester	Fourth Semester
(3) EET 203 (Electronics III)	(3) EET 253 (Electronics IV)
(3) EET 211 (Electric Machinery)	(1) EET 263 (Electrical Engineering Technology Laboratory IV)
(2) EET 213 (Electrical Engineering Technology Laboratory III)	(2) EET 376 (Specialty Laboratory)
(3) MA 224 (Introductory Analysis II)	(3) EG 110 (Drafting Fundamentals)
(4) PHYS 221 (General Physics)	(3) Technical elective
(3) Technical elective	(6) Nontechnical elective
<hr/>	<hr/>
(18)	(18)

INDUSTRIAL ENGINEERING TECHNOLOGY

This major field of specialization is designed to develop technicians to support the problem-solving and decision-making functions in management and to prepare for planning and control, work method analysis, work measurements, quality assurance and controls, and systems and procedures analysis. Practical applications of production-oriented operations research techniques, data processing and computer programming fundamentals are stressed.

The industrial engineering technician is often initially employed in the time study, quality control, production control, or plant layout department. As he gains experience, he may advance within the department, directly assisting a professional industrial engineer, or he may become a production supervisor. This broad technical background, together with the human relations background and a proficiency in engineering methods and mathematics, enables the industrial engineering technician to take advantage of opportunities for advancement in many directions.

* See footnote regarding mathematics course, p. 45.

FRESHMAN YEAR**First Semester**

- (3) EG 110 (Drafting Fundamentals)
- (3) IET 104 (Industrial Organization)
- (5) MA 150 (Mathematics for Technology)*
- (1) MET 100 (Applied Engineering Computations)
- (4) PHYS 220 (General Physics)

 (16)
Second Semester

- (3) English†
- (3) IET 204 (Techniques of Maintaining Quality)
- (3) CPT 200 (Computer Programming Fundamentals)
- (3) STAT 401 (Elementary Statistical Methods)
- (2) MET 335 (Basic Machining)
- (4) PHYS 221 (General Physics)

 (18)
SOPHOMORE YEAR**Third Semester**

- (3) ECON 210 (Principles of Economics)
- (3) IET 224 (Production Planning and Control)
- (3) IET 262 (Motion Study and Work Methods)
- (3) IS 252 (Human Relations in Industry)
- (2) IET 220 (Critical Path Analysis)
- (3) Technical elective

 (17)
Fourth Semester

- (3) GNT 220 (Technical Report Writing)
- (3) IET 250 (Fundamentals of Production Cost Analysis)
- (3) IET 266 (Work Measurement and Incentives)
- (3) COM 114 (Fundamentals of Speech Communication)
- (4-6) Technical electives

 (16-18)
TECHNICAL ELECTIVES**Methods Improvement Option**

- (3) IET 120 (Systems and Procedures)
- (2) IET 272 (Job Evaluation)
- (2) IET 296 (Industrial Technology Case Problems)

Material Handling Option

- (3) IET 268 (Plant Layout)
- (3) IET 312 (Materials Handling)
- (2) IET 296 (Industrial Technology Case Problems)

Supervisor Option

- (3) IS 240 (Labor Relations Problems)
- (3) IS 331 (Industrial Safety)
- (3) IS 374 (Industrial Supervision)
- (3) GNT 250 (Applied Creativity for Business and Industry)

 * See footnote regarding mathematics course, p. 45.

† Students will be counseled into ENGL 101 and 286, 100, 103 or 104 depending on the individual student's needs.

MECHANICAL ENGINEERING TECHNOLOGY

This program of study is designed to prepare students to take employment in industries requiring services of drafting and design of a mechanical nature.

Emphasis is placed on product and tool design, mechanical maintenance, testing, inspection, and the selection of methods for efficient and economical production.

Also included are courses dealing with fundamentals of industrial management and with some of the historical, economic, and human relations aspects of our American industrial life, all related to the individual.

Graduates of this program accept jobs as laboratory technicians, engineering assistants, detailers, draftsmen, tool maintenance men, layout men, inspectors, and machine and tool salesmen. With additional experience students may aspire to positions as industrial supervisors, machine and tool designers, tool buyers, production expeditors, and cost estimators.

A cooperative work program with industry may be made available to the student, to be worked out on an individual student basis.

FRESHMAN YEAR

First Semester	Second Semester
(1) MET 100 (Applied Engineering Computations)	(2) MET 204 (Production Drawing)
(2) MET 180 (Materials and Processes)	(2) MET 210 (Applied Statics)
(5) MA 150 (Mathematics for Technology)*	(3) MA 223 (Introductory Analysis I)
(3) EG 110 (Drafting Fundamentals)	(4) PHYS 220 (General Physics)
(3) ENGL 104 (English Composition I)	(3) GNT 220 (Technical Report Writing)
(3) Nontechnical elective	(3) COM 114 (Fundamentals of Speech Communication)
<hr/> (17)	<hr/> (17)

SOPHOMORE YEAR

Third Semester	Fourth Semester
(3) MET 200 (Power Systems)	(4) MET 216 (Machine Elements)
(4) MET 211 (Applied Strength of Materials)	(3) MET 330 (Introduction to Fluid Power)
(3) MA 224 (Introductory Analysis II)	(2) MET 335 (Basic Machining)†
(4) PHYS 221 (General Physics)	(3) Technical elective
(3) IS 252 (Human Relations in Industry)	(3) Technical elective
<hr/> (17)	<hr/> (15)

* See footnote regarding mathematics course, p. 45.

† MET 335 will be taken at the Calumet Campus.

PROFESSIONAL FOREMEN

This program is designed to meet the needs of the individuals who wish to improve their skills as first-line supervisors as well as their general education base.

Recognizing there are many different types of industries and different foremanship needs, a student's program is planned jointly by the individual, a representative of his firm, and an academic adviser.

The curriculum is college level, culminating in the awarding of the Associate in Applied Science degree. Graduates of the program are eligible to continue toward a Bachelor of Science degree in industrial supervision.

General Plan of Study

CORE		
Course Number	Course Title	Credit Hours
IS 252	(Human Relations in Industry)	3
IS 331	(Industrial Safety)	3
IET 104	(Industrial Organization)	3
IS 374	(Industrial Supervision)	3
Total		12

COMMUNICATIONS AREA

English composition or speech	3
Any area in communications	3
Total	6

FUNCTIONAL AREA

Recognizing that foremen work in various functional areas, each foreman will be expected to select one or more groups of courses that are designed to increase his effectiveness on the job. The following are examples of existing functional areas.

Quality Control	Mechanical Technology
Methods Improvement	Chemical-Antibiotic Industry
Materials Handling	Electrical Utilities
Production Planning	Electrical In-Plant Distribution
Personnel Relations	Bakery Laboratory Technology
Labor Relations	
Total	15 credit hours

SUPPORTIVE AREA

Each foreman should have a balanced educational experience. Therefore, he should take certain technical and nontechnical courses. Some of the more typical courses considered applicable are listed on the following page.

Nontechnical

INDM	200	(Accounting)
INDM	201	(Cost Accounting)
SOC	100	(Introductory Sociology)
PSY	120	(Elementary Psychology)
GNT	220	(Technical Report Writing)
ECON	210	(Principles of Economics)
IS	375	(Basic Methods of Industrial Training)
IS	376	(Personnel Problems in Industry)
IET	250	(Fundamentals of Production Cost Analysis)

Requirements**12-18 credit hours****Technical**

MA	150	(Algebra and Trigonometry)
CHM	111	(General Chemistry)
and	112	
PHYS	218	(General Physics)
and	219	
MET	100	(Applied Engineering Calculations)

Engineering and technology courses to be selected on the basis of the individual's career objectives and qualifications

Requirements**12-18 credit hours****Grand Total****62 credit hours****NURSING**

This program of nursing education provides a means of correlating the philosophy and standards of nursing education with those of general education. The overall standards and policies of the University apply to the program in nursing as they do to the other educational programs within the University. The associate degree program is designed to fulfill the educational needs of qualified high school graduates who want to (1) prepare for nursing in a relatively short time and (2) study in a multipurpose collegiate institution where they share the responsibilities, privileges, intellectual, and social experiences with all other students. Clinical practice experiences are obtained in nearby cooperating hospitals. The University nursing faculty selects, supervises, and evaluates all learning experiences.

Graduates are prepared to give care to patients as beginning general duty nurses, drawing upon their scientific knowledge and understanding of human behavior and needs. They are prepared to develop satisfactory relationships with people, to cooperate and share responsibility for their patients' welfare with other members of the nursing and health staff, and to be self-directive in learning from experience as practicing nurses.

Graduates of the associate degree program in nursing are eligible for state examinations for licensure as registered nurses.

All nursing courses must be taken in sequence.

FRESHMAN YEAR

First Semester

- (6) NT 115 (Nursing I)
- (3) BIOL 203 (Biology of Man)
- (3) PSY 120 (Elementary Psychology)
- (3) CHM 119 (General Chemistry)

(15)

Second Semester

- (6) NT 116 (Nursing II)
- (3) BIOL 204 (Biology of Man)
- (3) BIOL 220 (Introduction to Microbiology)
- (3) PCOL 201 (Pharmacology)
- (3) ENGL 104 (English Composition I)

(18)

SOPHOMORE YEAR

Third Semester

- (5) NT 225 (Maternal and Child Health Nursing)
- (5) NT 240 (Psychiatric-Mental Health Nursing)
- (3) Elective
- (3) F&N 303 (Essentials of Nutrition)

(16)

Fourth Semester

- (10) NT 224 (Nursing III)
- (3) NT 280 (Issues in Nursing)
- (3) SOC 100 (Introduction to Sociology)

(16)

CERTIFICATE PROGRAMS

The certificate programs are designed primarily for the more mature part-time student through consultation with representatives from labor, industry, and the service areas of our society.

These are intensive and practical programs of less than 40 semester hours of credit. Advancement in each of these programs can be varied to suit the needs of the individual students who may take one, two, or three courses each semester. The average part-time student can complete any one of the programs within three years.

Enrollment is on the basis of a program carefully tailored to meet individual student needs and vocational objectives through consultation with an experienced counselor. Changes in the student's program arising out of new work assignments or changes in vocational objective may be worked out with his counselor.

Professional Foremanship

The Professional Foremanship Certificate Program is an intensive and practical curriculum equivalent to 36 semester hours. It is intended to provide foremen with the professional education needed to handle the many supervisory and technical problems which they meet daily in technical, communications, and human relations fields.

The program has been set up by representatives of industry, professional foremen organizations, and the University. It is designed to meet the needs of management, which is vitally concerned with training foremen for positions of leadership.

The Professional Foremanship Program is the certificate program counterpart of the industrial engineering technology two-year curriculum. Course selection is on the basis of a program worked out with the counselor assigned and is carefully tailored to individual needs.

Admission to the program is granted to those mature adults in management positions who meet the entrance standards and requirements.

Candidates may be admitted as degree or nondegree students. Specific questions concerning the program should be directed to the professional foremanship coordinator at the North Central Campus.

REQUIRED COURSES

(9 credit hours)

- (3) IET 104 (Industrial Organization)
- (3) IS 252 (Human Relations in Industry)
- (3) COM 114 (Fundamentals of Speech Communication)

CORE CURRICULUM

(6 credit hours)

Two of the following three courses are required in the basic core curriculum.

- (3) IET 104 (Industrial Organization)
- (3) IS 240 (Labor Relations Problems)
- (3) IS 374 (Industrial Supervision)

ELECTIVES

(9 credit hours)

Additional courses to make a total of 24 credit hours may be chosen in any approved combination.

MANAGEMENT EXPERIENCE

(Equivalent to 12 semester hours)

Before receiving the Professional Foremanship Certificate, the candidate must have had two years of successful experience in the management field. Satisfaction of this requirement is met by a confirming letter from the managerial employer under whom the candidate worked. Formal credit is not established for this work, but is considered equivalent to 12 semester hours of credit in the Professional Foremanship Program.

BACHELOR OF SCIENCE DEGREE IN INDUSTRIAL EDUCATION

The Department of Industrial Education consists of two sections: industrial arts and vocational-technical. Each section is concerned with one or more programs and activities designed to equip men and women for entrance into career fields that require an intellectual base upon which practical applications of the knowledge gained in the humanities, the sciences, and the technologies depend. Thus, the courses provided offer a combination of theoretical and practical education.

Graduate and undergraduate programs which prepare students for entrance into a variety of careers in business, education, government, and industry are available. Students may elect to pursue an option or major which will lead to

the degree of Bachelor of Science in Industrial Education with a specialty in one of the following areas:

1. Technology teaching (junior college and technical institute teaching)
2. Industrial arts teaching
3. Vocational-industrial-teaching

BACHELOR OF SCIENCE DEGREE FOR A.A.S. TECHNICIANS

Through its School of Technology, the University has recognized the need of the graduate of two-year Associate in Applied Science degree and similar curricula for further and broader education. New third- and fourth-year curricula have been especially developed to lead to the Bachelor of Science degree for such students.

The baccalaureate program provides the general education which permits the graduate to engage in a significantly broader span of activities. It provides a very important background in interdisciplinary studies and creates a greater potential for the graduate. It also enables the graduate to do additional work in his area of specialization.

This program was designed by the School of Technology with the active assistance of industry. It is offered to enable the engineering technician, and similar students who have completed an associate degree program, to improve his performance and increase significantly his promotability.

Graduate Study

GRADUATE COURSES are available at the Purdue North Central Campus. These courses are under the direction of their respective departments subject to the rules and regulations of the Graduate School of Purdue University. All courses offered by the University at any campus are subject to the same standards of quality.

ADMISSIONS

Students may be admitted to the Graduate School and undertake work at the North Central Campus in one of two categories: (1) regular graduate students and (2) nondegree students.

Students enrolling in graduate courses who have been admitted to a graduate school should insure that the course in which they desire to enroll will be accepted in their plan of study.

Students who plan to be admitted to a graduate program in the future must understand that graduate courses taken prior to being admitted may or may not be approved by their graduate committee as a part of their degree requirements.

Regular Graduate Students

Students who have advanced degree objectives will be admitted as regular graduate students if they have the following qualifications:

They will ordinarily be expected to hold a baccalaureate degree from a college or university of recognized standing. Under special circumstances individuals who do not have a baccalaureate degree will be considered for admission if they have completed studies equivalent to those required for a baccalaureate degree program at Purdue.

All candidates for admission as regular graduate students must show promise, as judged by academic performance and experience, of ability to perform advanced study and research, and must have adequate preparation in their chosen field of study. Applicants must submit complete official transcripts of all previous college and university studies.

Nondegree Students

Such students are not admitted with advanced degree objectives and are not eligible to become candidates for advanced degrees under this classification.

Subclassifications at the North Central Campus are:

1. Temporary graduate students admitted on the basis of the educational services which can be extended to them in meeting their individual needs—other than degrees.
2. Teaching license objectives which are intended for baccalaureate degree holders seeking to work on teacher license programs without degree objectives either preceding or following an advanced degree program.
3. Nondegree or temporary students should realize that no more than nine semester hours of credit may be applied to a regular plan of study if they subsequently become regular graduate students.

GRADUATE ADVISING

Graduate programs are intended to be highly individualized, whenever feasible, thus each student is guided by a major professor and an advisory committee. Degree-seeking students should contact the assigned graduate adviser for assistance.

GRADUATE RECORD EXAMINATION

An applicant who falls in one or more of the following four categories is expected to take the Aptitude Test Section of the Graduate Record Examination.

1. If he received his bachelor's degree from a nonaccredited institution.
2. If he expects to major in aeronautics, astronautics, and engineering sciences; chemical engineering; child development and family life; clothing and textiles; economics; equipment and family housing; foods and nutrition; history; home management and family economics; industrial education; industrial relations; institutional management; nuclear engineering; physical education for women; political science, psychology; or sociology. Other departments may be added to this list,

3. If he feels that his previous academic record does not adequately reflect his ability.
4. If he is to be considered for certain fellowship programs. He will be informed of this requirement when he applies for the fellowship.

Information regarding testing dates and locations may be obtained by writing to the Educational Testing Service, Box 955, Princeton, New Jersey 08540.

GRADUATE COURSE DESCRIPTION

Descriptions of specific courses may be found in *The Graduate School* bulletin.

Description of Courses

COURSES NUMBERED 1-499 are primarily for undergraduate students. Courses numbered 500-599 are for undergraduates (usually juniors and seniors) and graduate students. Courses numbered 600 and above are for graduate students.

For each course the first line of the description should be interpreted as follows: first, the official number of the course; second, its special title; and third, the number of class, laboratory, and credit hours.

School of Agriculture

Dean R. L. Kohls in Charge

AGRICULTURE

D. C. Pfendler, in Charge

AGR 101. AGRICULTURAL LECTURES. Class 2, cr. 1.

To acquaint new students in agricul-

ture with the important problems and opportunities in the various fields of agriculture.

AGRICULTURAL ECONOMICS

C. E. French, Head of the Department

AGEC 100. INTRODUCTORY AGRICULTURAL BUSINESS AND ECONOMICS. Class 3, cr.

3.

The role and characteristics of farm and off-farm agricultural business in our economy; introductory economic and

business principles involved in successful organization, operation, and management.

AGEC 330. MANAGEMENT OF BUSINESS RELATED TO AGRICULTURE. Class 3, cr. 3.
Management of the nonfarm firm, with

emphasis on business selling to farmers and handling their products. Production; merchandising; advertising and sales promotion; financial management; employee relations; general administrative policy formulation and administration.

AGRONOMY

M. W. Phillips, Head of the Department

AGRY 105. CROP PRODUCTION. Class 2, Lab. 2, cr. 3.

Fundamental principles in crop production, distribution, rotations, soil relations; grain and forage crops adaptation, characteristics, harvesting, storage, and marketing.

AGRY 255. SOIL SCIENCE. Class 1, Lab. 3, cr. 3. Prerequisites: CHM 111 and 112, or equivalent.

Soil management and fertility. Designed for students taking only one course in soils.

AGRY 430. GENETICS. Class 3, cr. 3. (el.).
Prerequisite: BIOL 108 or 109, or equivalent.

The transmission of heritable traits, probability; genotypic-environmental interactions; chromosomal aberrations; polyploidy; gene mutations; genes in populations; the structure and function of nucleic acids; biochemical genetics; molecular genetics; coding.

AGRY 430L. GENETICS LABORATORY. Lab. 2, cr. 1. Prerequisite or corequisite: AGRY 430.

Experiments and demonstrations with higher plants, fruit flies, flour beetles, mice, bacteria, bacterial viruses, and fungi to elucidate the basic principles of genetics.

ANIMAL SCIENCES

W. R. Woods, Head of the Department

ANSC 101. ANIMAL AGRICULTURE. Class 3, cr. 3 (el. 2 to 4 A).

Importance of livestock in the field of agriculture, and the place of meats and other animal products in the human diet.

ANSC 221. INTRODUCTION TO ANIMAL NUTRITION. Class 3, cr. 3. Prerequisite: CHM 111 or 112, or equivalent.

A study of the digestive processes, composition of foodstuffs, nutritional requirements, and formulation of practical rations for farm animals.

FORESTRY AND CONSERVATION

W. C. Bramble, Head of the Department

FOR 582. CONSERVATION OF NATURAL RESOURCES. Class 2, Lab. 3, cr. 3.

Prerequisite: at least junior standing.
Classroom and laboratory instruction in

natural resource conservation. Designed for teachers of vocational agriculture, biological sciences, general sciences, home economics, and social studies.

HORTICULTURE

H. T. Erickson, Head of the Department

HORT 102. INTRODUCTION TO GENERAL HORTICULTURE. Class 3, cr. 3.

A study of the horticultural industry with emphasis on basic scientific, techno-

logical, and esthetic principles underlying the production, marketing and utilization of horticultural crops.

Schools of Engineering

Dean J. C. Hancock in Charge

AERONAUTICS, ASTRONAUTICS, AND ENGINEERING SCIENCES

G. A. Hawkins, Acting Head of the School

Assistant Professor: J. C. Hayes.

ESC 205. BASIC MECHANICS I. Class 3, cr. 3.
Prerequisites: MA 162 and
PHYS 152.

Fundamental concepts, force systems, graphical representation of force systems, equilibrium, distributed forces, hydrostatics, virtual work, static stability, friction. First and second moments of areas, volumes, and masses, center of gravity. Application to structural and machine elements, such as bars, beams, trusses, cables, friction devices.

ESC 206. BASIC MECHANICS II. Class 3, cr. 3.
Prerequisites: ESC 205 or 221
and MA 261.

Fundamental concepts, kinematics, translation, and rotation. Kinetics, impulse momentum, work, energy. Rectilinear and curvilinear translation of point masses. Plane motion of rigid bodies and vibration. Application to projectiles, gyroscopes, machine elements, and other engineering systems.

ESC 223. MECHANICS OF MATERIALS. Class 3,
cr. 3. Prerequisite ESC 205.

Analysis of stress and strain; equations of equilibrium and compatibility; stress-strain laws; extension, torsion, and bending of bars; membrane theory of pressure vessels; elastic stability; selected topics.

CIVIL ENGINEERING

J. F. McLaughlin, Head of the School

EG 110. DRAFTING FUNDAMENTALS. Class 1,
Lab. 6, cr. 3.

A basic course in drawing orthographic projection, pictorial drawing, print reading, and reproduction of drawings. Problems designed to require practical reasoning and develop good techniques.

EG 116. GRAPHICS I. Class 1, Lab. 4, cr. 2
(1 or 2 ENGR, el.).

Basic graphical methods—instrument and freehand—useful in engineering layout and design for analysis and communication. Multiview representation with some sketching and basic dimensioning practices. Auxiliary views with sectioning and some conventional representations. Engineering lectures and counseling for scheduling by Department of Freshman Engineering.

School of Home Economics

Dean N. H. Compton in Charge

F&N 303. ESSENTIALS OF NUTRITION. Class 3,
cr. 3. No prerequisites: Credits
not given for both F&N 303 and 315.

Basic nutrition and its application in

meeting needs of all ages. Consideration is given to food selection and legislation and community nutrition education programs.

School of Humanities, Social Science, and Education

Acting Dean G. P. Salen in Charge

COMMUNICATION

R. E. Nadeau, Head of the Department

Associate Professor: E. F. Buck.

Assistant Professor: Uvieja Good.

COM 114. FUNDAMENTALS OF SPEECH COMMUNICATION. Sem. 1 and 2. SS. Class 3, cr. 3.

A study of communication theories as applied to speech; practical communicative experiences ranging from interpersonal communication and small group process through problem identification and solution in discussion, to informative and persuasive speaking in standard speaker-audience situations.

COM 240. INTRODUCTION TO ORAL INTERPRETATION. Class 3, cr. 3. Prerequisite: COM 114.

Effective reading of prose, poetry, and drama after an analysis of the meaning and emotional content in each selection. Theory and practice.

COM 315. SPEECH COMMUNICATION OF TECHNICAL INFORMATION. Sem. 1. SS. Class 3, cr. 3. Prerequisite: COM 114. Open only to students enrolled in the School of Technology.

The organization and presentation of information of a practical technical nature. Emphasis is placed upon the study, preparation, and use of audio-visual materials in such presentations.

COM 318. PRINCIPLES OF PERSUASION. Sem. 1 and 2. SS. Class 3, cr. 3. Prerequisite: COM 114 or consent of instructor.

Persuasion and its effects on behavior with emphasis on evidence and reasoning and on emotional and personal proof; practice in critical reception as well as effective composition of persuasive discourse.

COM 320. GROUP DISCUSSION AND CONFERENCE LEADERSHIP. Sem. 1 and 2. SS. Class 3, cr. 3. Prerequisite: COM 114.

A study of group thinking and problem-solving methods; participation in and evaluation of committee and informal discussion groups.

COM 415. DISCUSSION OF TECHNICAL PROBLEMS. Sem. 2. SS. Class 3, cr. 3. Prerequisite: COM 315. Open only to students in the School of Technology.

Principles of speech communication related to interpersonal and group discussions on technical topics and problems; practice in using these models in situations typically encountered by the technologists.

CREATIVE ARTS

C. M. Dorn, Head of the Department

Art and Design

A&D 201. ART FOR ELEMENTARY SCHOOL TEACHERS. Class 2, Studio 4, cr. 4.

Art theory and experiences and curriculum theory and materials preparatory to instruction of elementary school children.

A&D 355. ART APPRECIATION. Class 3, cr. 3. Not open to freshmen.

Understanding and appreciation of the problems overcome by mankind in the origins and growth of art. Satisfies the aesthetics requirement of the School of

Humanities, Social Science, and Education.

Music

MUS 250. MUSIC APPRECIATION. Class 3, cr. 3.

An introduction to the understanding of music. How to listen to its materials. A study of the media, forms, styles, and composers through recorded, live, and film media. Methods used in the structure of music as well as the aesthetic values present in music are also emphasized. Satisfies the aesthetics requirements of the School of Humanities, Social Science, and Education.

EDUCATION

C. R. Hicks, Head of the Department

Assistant Professor: L. R. Blythe.

Instructor: J. G. Hodges.

ED 249. DIRECTED OBSERVATION IN THE ELEMENTARY SCHOOL.* Lab. 3, cr. 1.

Directed observation for one-half day per week in elementary school classrooms. Individual and group conferences and written records are required.

ED 285. EDUCATIONAL PSYCHOLOGY. Class 3, cr. 3. Prerequisite: PSY 120.

An introduction to the application of psychological theories, research results, and methods of inquiry to educational problems, with particular emphasis on human development, learning, and measurement.

ED 320. TEACHING THE LANGUAGE ARTS IN THE ELEMENTARY SCHOOL.* Class 3, cr. 3.

Materials and methods of teaching oral and written language, listening, spelling, and handwriting in the elementary school.

ED 321. TEACHING ARITHMETIC IN THE ELEMENTARY SCHOOL.* Class 3, cr. 3.

Materials and methods used in teaching arithmetic at various grade levels in the elementary school.

ED 324. MUSIC FOR ELEMENTARY SCHOOL TEACHERS.* Class 3, cr. 3.

Basic musical experience, including elementary music skills. Principles and procedures of teaching music. Relationship of music to other subject areas. Music materials.

ED 326. TEACHING READING IN THE ELEMENTARY SCHOOL.* Class 3, cr. 3.

Methods and materials for teaching reading in the elementary school.

ED 327. CORRECTIVE READING FOR THE CLASSROOM TEACHER.* Sem. 1 and 2. SS. Class 2, Lab. 3, cr. 3. Prerequisites: ED 285, 326, 385.

Classroom procedures for the identification of reading difficulties; selection and application of appropriate methods and materials to provide corrective treatment.

ED 385. CASE STUDIES OF ELEMENTARY SCHOOL CHILDREN.* Cr. 2. Prerequisite: ED 285, or consent of instructor.

Presents methods of collecting information about the behavior and development of elementary-age children and provides experience in using case studies in planning for individual children.

ED 523. INTRODUCTION TO MEASUREMENT AND EVALUATION. Class 2, Lab. 2, cr. 3.

An introduction to the basic concepts and principles of measurement and evaluating, including elementary statistics, principles of test construction, survey of standardized tests.

ED 530. ADVANCED EDUCATIONAL PSYCHOLOGY.

Class 3, cr. 3. Prerequisites: PSY 120 and ED 285.

Theories of learning and development, research on instruction and learning, and principles of measurement applied to educational problems.

ED 536. FOUNDATIONS FOR REMEDIAL READING.

Class 3, cr. 3. Prerequisite: 12 hours of education and psychology.

First course in sequence leading to certification as a reading specialist, but may be elected by others needing basic information in reading. Considers history, psychology and physiology, and current practices in developmental and remedial reading.

ED 570. AUDIO-VISUAL MEDIA. Cr. 3. Prerequisite: 12 hours of education and psychology.

Sources, selection, and effective use of audio-visual materials.

ED 571. PREPARATION OF INSTRUCTIONAL MATERIALS. Class 1, Lab. 4, cr. 3.

Design and preparation of a variety of instructional materials for use by instructional materials specialists, teachers, librarians, and A-V coordinators in educational situations. Laboratory practice is provided in production of these materials.

ED 580. MEDIA FOR CHILDREN. Class 3, cr. 3.

Prerequisite: five hours of education and psychology.

Selection and use of library materials for children.

* Prerequisite: admission to the elementary education curriculum.

ED 581. MEDIA FOR YOUNG ADULTS. Sem. 1 and 2, and alternating SS. Class 3, cr. 3. Prerequisites: junior standing and three hours of educational psychology.

Evaluation, selection, and use in the broad subject fields of printed, filmed, and recorded materials for young adults, to meet personal and educational needs.

ED 591. EDUCATIONAL PROBLEMS OF TEACHERS. Cr. 1-4.

Primarily for experienced teachers desiring credit from special workshops or individual study. Topics of individual study will deal with problems which arise from the professional work of classroom teachers.

ED 600. HISTORY AND PHILOSOPHY OF EDUCATION. Class 3, cr. 3. Prerequisite: 12 hours in education.

Consideration of the major ideas, trends, and movements in the development of American education.

ED 675. LANGUAGE ARTS IN THE ELEMENTARY SCHOOL. Class 3, cr. 3. Prerequisite: ED 320, its equivalent, or admission by consent of the instructor.

Research, recent trends, and current developments in the field of language arts

and implications for classroom practice in the elementary school.

ED 676. READING IN THE ELEMENTARY SCHOOL.

Class 3, cr. 3. Prerequisite: ED 376, its equivalent, or consent of instructor.

Research, recent trends, and current developments in the field of reading instruction. Emphasis will be on improving developmental reading in the elementary school programs rather than on surveying remedial programs.

ED 679. ELEMENTARY SCHOOL CURRICULUM.

Class 3, cr. 3. Prerequisite: 12 hours in education and psychology.

Needs of children and society; modern programs; procedures for developing a curriculum, including ways to improve the present offerings of a school.

ED 680. REVIEW OF RESEARCH IN ELEMENTARY EDUCATION. Cr. 3. Prerequisite: ED 430 or equivalent.

A study of research important generally to elementary education. Critical analysis of research in one area of special interest.

ED 681. IMPLICATIONS OF RESEARCH AND THEORY FOR PROBLEMS IN ELEMENTARY SCHOOLS. Class 3, cr. 3.

ENGLISH

J. H. Adler, Head of the Department

Acting Section Chairman: J. J. Stanfield.

Assistant Professors: J. M. Bostich, B. M. Lootens, R. C. Schlobin, J. J. Stanfield.

Instructor: H. W. Phillips.

ENGL 100. ENGLISH COMPOSITION. Class 2, Lab. 3, cr. 3. This course is the equivalent of ENGL 101 for freshmen whose test scores indicate a need for directed practice in the patterns of English prose and a review of fundamentals in English as applied in writing, in addition to the regular work that is assigned in ENGL 104. Students who have made sufficient progress by the end of the first semester, or by the end of any succeeding semester, are given three hours credit for ENGL 104.

Emphasis on the organization of expository paragraphs and the expository theme. Directed writing and revising of themes based on personal experience, and the relationship between experience and

language, and the relationship between experience and ideas.

ENGL 103. ADVANCED FRESHMAN COMPOSITION.

Class 3, cr. 3 (Freshmen).

An introduction to composition and literature in which students will study the elements of good writing, various approaches to fiction, poetry, and drama, and basic literary terms.

For freshmen provisionally excused from ENGL 104. Required of all ENGL majors, who, if they are not originally assigned to it, qualify by making a C or higher in ENGL 104.

Students taking ENGL 103 as their first English course who receive grade C or higher will be excused from ENGL

105 and given credit for ENGL 104; those who receive grade D must take ENGL 104 or 105 depending upon the recommendation of the English 103 instructor; those who fail ENGL 103 must take both ENGL 104 and 105.

ENGL 104. ENGLISH COMPOSITION I. Class 3, cr. 3 (Freshmen). Prerequisite for all courses in English except ENGL 2, 103, and 185.

Emphasis on the organization of the expository theme. Directed writing of themes based on personal experience, on the relationship between experience and language, and on the relationship between experience and ideas.

ENGL 105. ENGLISH COMPOSITION II. Class 3, cr. 3. Not open to students who have earned a grade of C or higher in ENGL 103.

The second half of the basic composition sequence. Emphasis on the logical and rhetorical problems involved in writing.

ENGL 185. DEVELOPMENTAL READING. Lab. 2, cr. 1.

Purpose: to increase reading efficiency by improving comprehension and by developing the motor skills involved in reading speed. Stimulates reading interest through use of films and pacers.

ENGL 201. THE NATURE OF LITERARY STUDY. Class 3, cr. 3.

A study of literary concepts and critical procedures as applied to representative poetry, fiction, and drama, with practice in critical writing.

ENGL 230. INTRODUCTION TO LITERATURE. Class 3, cr. 3. Not open to students with credit for ENGL 238.

Reading and discussion of major works in English, American, and continental literature to develop an understanding of style, form, and ideas characteristic of great works. Emphasis on types of narrative literature.

ENGL 231. INTRODUCTION TO LITERATURE. Class 3, cr. 3.

Reading and discussion of major works in English, American, and continental literature to develop an understanding of style, form, and ideas characteristic of great works. Emphasis on various types of literature.

ENGL 235. INTRODUCTION TO THE DRAMA. Class 3, cr. 3.

Reading and discussion of a number of plays, most of them modern, aimed at an appreciation of the drama as literature and as entertainment.

ENGL 237. INTRODUCTION TO POETRY. Class 3, cr. 3.

How to read poetry intelligently; function of description, metrics, figures of speech, and theme; place of a poem in history, uses of poetry, etc.

ENGL 238. INTRODUCTION TO FICTION. Class 3, cr. 3. Not open to students with credit for ENGL 230.

Reading and discussion of selected short stories and seven novels to promote awareness, understanding, and appreciation of the range, values, techniques, and meanings of reputable modern fiction.

ENGL 240. INTRODUCTION TO THE LITERATURE OF ENGLAND: FROM THE BEGINNINGS TO SWIFT AND POPE. Class 3, cr. 3.

A survey with emphasis on the study of selected texts from the major writers, this course aims at both competence in literary analysis and awareness of the relation between each writer and his times.

ENGL 241. INTRODUCTION TO THE LITERATURE OF ENGLAND: FROM THE RISE OF ROMANTICISM TO THE TWENTIETH CENTURY. Class 3, cr. 3.

A continuation of ENGL 240, this course carries the same study from the mid-eighteenth to the twentieth century.

ENGL 250. GREAT AMERICAN BOOKS. Class 3, cr. 3.

Seven books, such as *The Scarlet Letter*, *Moby-Dick*, and *Walden*, read and discussed as to their literary qualities and their cultural significance.

ENGL 262. GREEK AND ROMAN CLASSICS IN TRANSLATION. Class 3, cr. 3.

Study of important works of Greek and Roman literature, their intrinsic literary values, and their influence on later European and American writing and thinking.

ENGL 266. WORLD LITERATURE: ANCIENT, MEDIEVAL, AND RENAISSANCE PERIODS. Class 3, cr. 3.

Western world literature in translation, primarily Greek, Hebrew, and early European—the basis of our cultural heritage; and particular attention to Homer, Greek drama, Plato, the Bible, and Renaissance writers.

ENGL 267. WORLD LITERATURE: EIGHTEENTH, NINETEENTH, AND TWENTIETH CENTURIES. Class 3, cr. 3.

Western world literature in translations and in English originals from about 1700 to the present; the changes and growth in our cultural heritage, as reflected primarily in French, English, German, and Russian imaginative writing.

ENGL 285. CRITICAL READING. Class 2, cr. 2.
Prerequisite: ENGL 185 or consent of instructor.

Close reading of selected current magazines and newspapers, emphasizing efficient techniques for finding general meaning. Includes the application of elementary logical and semantic analysis.

ENGL 286. VOCABULARY BUILDING. Lab. 2, cr. 1.

Development of vocabulary through study of the characteristics of the language, usage, and word formation; exercises and dictionary practice; selected readings.

ENGL 304. ADVANCED COMPOSITION. Class 3, cr. 3.

Designed for students who wish additional training in composition beyond the basic requirements. Extensive practice in the writing of mature expository, critical, and argumentative prose. (The course satisfies the Indiana certification requirement of three hours of advanced composition.)

ENGL 350. AMERICAN WRITERS FROM 1800 TO 1865. Class 3, cr. 3. Not open to students who have credit for ENGL 250.

Deals with writers generally called Romantics and Transcendentalists with the emphasis on Irving, Cooper, Bryant, Hawthorne, Poe, Melville, Emerson, Thoreau, and Whitman. Others will be read and connections made between their work and the times.

ENGL 351. AMERICAN WRITERS FROM 1865 TO 1910. Class 3, cr. 3. Not open to students who have credit for ENGL 250.

Deals with writers of the "Gilded Age" and at the turn of the century. Students will read the work of writers associated with the regional and local color movements, the rise of realism, and the beginning of naturalism. The principal writers are Dickinson, Twain, Adams, Howells, James, Crane, Robinson, and

Dreiser. Others will be read and connections made between their work and the times.

ENGL 372. INTRODUCTION TO AMERICAN FOLKLORE. Class 3, cr. 3.

Introduction to the study of Anglo-American traditions: folk tale, song, dance, humor, superstition, games, beliefs, etc., with emphasis on informal discussion of readings, recordings, movies, and lectures.

ENGL 376. THE MOVIES. Class 2, Lab. 3, cr. 3.

The history of the movies from *The Great Train Robbery* and *The Birth of a Nation* or *Intolerance* to contemporary films. Comparison of the cinematic method with the methods of the drama and the novel.

ENGL 377. MAJOR MODERN POETRY. Class 3, cr. 3.

The development of new trends in and the interrelationships among the poetry of Ireland, Britain, and the United States. Poets central to modernism, such as Yeats, Pound, Eliot, Williams, and Stevens will be emphasized, and students will also read more recent poets.

ENGL 381. THE BRITISH NOVEL. Class 3, cr. 3.

Studies in the historical development of the British novel, with reading and discussion of representative works of the eighteenth and nineteenth centuries.

ENGL 382. THE AMERICAN NOVEL. Class 3, cr. 3.

Reading and discussion of representative American novels from Hawthorne to Faulkner, emphasizing major trends in purpose, content, and technique. Supplementary lectures on background materials.

ENGL 405. CREATIVE WRITING. Class 3, cr. 3.
(May be repeated for credit.)

Informally conducted for students who enjoy writing—of any kind except the narrowly technical—and concerned with problems of form, style, diction, sentence structure. Workshop criticism.

ENGL 442. SIX PLAYS BY SHAKESPEARE. Class 3, cr. 3.

Shakespeare's dramatic craftsmanship, poetry, humor, characterization, psychology, and modern pertinence illustrated in representative tragedies, comedies, and history plays.

ENGL 455. MAIN CURRENTS OF AMERICAN THOUGHT. Class 3, cr. 3.

A survey of dominant ideas and intellectual trends in America from 1607 to the present as revealed through American literature and as related to American life and culture.

ENGL 456. AMERICAN HUMOR. Class 3, cr. 3.

Humorous writings of the nineteenth and twentieth century are studied as to form and technique and also as a reflection of American life. Special emphasis on Mark Twain.

ENGL 457. THE NEGRO IN AMERICAN LITERATURE. Class 3, cr. 3.

A survey of writers of the novel, both black and white, in America prior to 1925 who have commented on or interpreted the Negro position in historical or contemporary society.

ENGL 479. THE SHORT STORY. Class 3, cr. 3.

A historical and critical study of nineteenth- and twentieth-century short stories—Irish, British, American, and continental.

ENGL 493. DIRECTED READING. Cr. 1-3. Admission by consent of instructor. (May be repeated for credit.)

Directs the reading of students with special interests. Guides students in profitable reading in subjects of their own choice. Individual conferences only—no class meetings.

(General prerequisite for all English literature courses numbered above 500: six hours of composition and six hours of literature, or permission of the instructor.)

ENGL 533. TUDOR LITERATURE. Class 3, cr. 3.

Nondramatic literature of the English Renaissance up to 1603, particularly Elizabethan. Representative selections in both prose and verse art studied, with special attention to Spenser, Sidney, and Shakespeare.

ENGL 535. RESTORATION AND EARLY EIGHTEENTH-CENTURY LITERATURE. Class 3, cr. 3.

A survey of the nondramatic literature from 1660 to 1744, from Clarendon through Thomson. Emphasizes Bunyan, Dryden, Pope, and Swift.

ENGL 547. THE ROMANTIC MOVEMENT ENGLISH LITERATURE. Class 3, cr. 3.

Principal writers of the Romantic Movement (Burns to Keats), emphasizing Wordsworth; relation of the historical background to the thought and feeling of the writers concerned.

ENGL 548. VICTORIAN LITERATURE. Class 3, cr. 3.

A survey of English poetry and prose from about 1832 to about 1880.

ENGL 558. THE RISE OF REALISM IN AMERICAN LITERATURE. Class 3, cr. 3.

A survey of American literature from about 1855 to 1900, beginning with Whitman and ending with James and the early naturalists.

ENGL 575. MODERN AMERICAN DRAMA. Class 3, cr. 3.

Representative plays by major American playwrights from 1920 to the present.

ENGL 580. LITERATURE AND MODERN THOUGHT. Class 3, cr. 3.

Readings in literature, philosophy, and social criticism, concentrated on the political, industrial, and scientific revolutions that have molded modern life and thought.

ENGL 590. DIRECTED WRITING. Cr. 1 to 3. Prerequisite: Consent of the instructor. (May be repeated for credit.)

Writing—creative, popularly technical, biographical, historical, philosophical—on subjects of the student's choice. Individual conferences only. No class meetings.

ENGL 595. CONTEMPORARY AMERICAN FICTION. Class 3, cr. 3.

Study of fiction of the past two or three decades as it relates to American literary traditions and thought. Survey of scholarship and criticism. Examinations and critical papers.

ENGL 693. DIRECTED READING. Cr. 1-3. Admission by consent of instructor.

Directs the reading of students with special interests. Guides students in profitable reading in subjects of their own choice. Individual conferences—no class meetings. May be repeated for credit.

HISTORY

D. J. Berthong, Head of the Department

Associate Professor: H. Jablon.

HIST 103. INTRODUCTION TO WESTERN CIVILIZATION: THE MEDIEVAL WORLD. Sem. 1 and 2. SS. Class 3, cr. 3.

A survey of European history from the disintegration of the western Roman Empire through the age of expansion and discovery in the sixteenth century. Major emphasis is placed on those institutions and habits of thought peculiar to western Europe, in the medieval era including feudal relations, Benedictine monasticism, the Papacy, the German Empire, and scholastic theology. Relevant contemporary developments in the Byzantine and Islamic worlds, however, are also studied. Designed to meet the needs of the beginning student in European history.

HIST 104. INTRODUCTION TO WESTERN CIVILIZATION: THE MODERN WORLD. Sem. 1 and 2. Class 3, cr. 3. (Formerly HIST 201).

Traces the expansion of Europe into the Americas, Africa, and Asia. The French Revolution, nationalism, and the development of Western European states from the era of the Reformation to the present are studied.

HIST 151. AMERICAN HISTORY TO 1877. Sem. 1 and 2. SS. Class 3, cr. 3.

A study of the development of American political, economic, and social institutions from the early explorations and colonial settlements through Reconstruction.

HIST 152. UNITED STATES SINCE 1877. Sem. 1 and 2. SS. Class 3, cr. 3.

A study of the growth of the United States from 1877 to the present. The new industrialism, agrarian problems, depression, the New Deal, the two world wars, the cold war, and similar topics are analyzed.

HIST 367. TWENTIETH-CENTURY AMERICAN HISTORY. Class 3, cr. 3. Prerequisites: HIST 151 and 152.

A survey of twentieth-century American history, covering major political and economic developments and related intellectual movements. A parallel consideration of foreign affairs traces the emergence of America as a world power and the effects of her new status on the Western Hemisphere, Europe, and Asia.

HIST 466. INDUSTRIALISM AND THE PROGRESSIVE ERA, 1877 TO 1914. Class 3, cr. 3. Prerequisite: HIST 152.

A survey of late nineteenth- and early twentieth-century American history covering the industrial and corporate development, the Spanish-American War and the resulting imperialism; and the growth of governmental regulation and control.

HIST 467. RECENT AMERICAN HISTORY. Class 3, cr. 3. Prerequisites: HIST 151 and 152.

A study of twentieth-century American history into the depression thirties. Domestic political and social developments will be traced from 1914 to 1939, while diplomatic and military events will be covered from the early twentieth century to 1933. Particular attention will thus be given to the First World War and the Great Depression.

HIST 586. UNITED STATES FOREIGN AFFAIRS TO 1900. Class 3, cr. 3. Must be preceded by HIST 104 or 151, or consent of instructor.

An examination of United States' relationships with the rest of the world from the colonial period to the end of the nineteenth-century, viewed in the perspectives of national development and international politics. Changes in policy and its ideological expression are analyzed, reflecting the drive for territorial expansion, the shifting focus of domestic political concerns, and the altered power position of the United States by the beginning of the twentieth-century.

MODERN LANGUAGES

D. H. Walther, Head of the Department

Assistant Professor: H. Sokolowski.

Instructors: R. Danald, R. C. Rentz.

French

FR 101. FIRST COURSE IN FRENCH. Class 3, Lab. 1, cr. 3. For beginners only.

Unless recommended by the head of the school in which the student is registered, a student may not apply toward graduation the credit for FR 101 without satisfactorily completing a more advanced course in French.

FR 102. SECOND COURSE IN FRENCH. Class 3, Lab. 1, cr. 3. Prerequisite: FR 101. Continuation of FR 101.

FR 203. THIRD COURSE IN FRENCH. Class 3, cr. 3. Prerequisite: FR 102.

Readings from works of modern and contemporary French writers; practice in speaking and writing French.

FR 204. FOURTH COURSE IN FRENCH. Class 3, cr. 3. Prerequisite: FR 203. Continuation of FR 203.

German

GER 101. FIRST COURSE IN GERMAN. Class 3, Lab. 1, cr. 3. For beginners only.

Unless recommended by the head of the school in which the student is registered, a student may not apply toward graduation the credit for GER 101 without satisfactorily completing a more advanced course in German.

GER 102. SECOND COURSE IN GERMAN. Class 3, Lab. 1, cr. 3. Prerequisite: GER 101. Continuation of GER 101.

GER 203. THIRD COURSE IN GERMAN. Class 3, cr. 3. Prerequisite: GER 102.

Readings from the works of nineteenth-century and contemporary German writers; practice in speaking and writing German.

GER 204. FOURTH COURSE IN GERMAN. Class 3, cr. 3. Prerequisite: GER 203. Continuation of GER 203.

Russian

RUSS 101. FIRST COURSE IN STANDARD RUSSIAN. Class 3, Lab. 1, cr. 3. For beginners only.

Unless recommended by the head of the school in which the student is registered, a student may not apply toward graduation the credit for SPAN 101 without satisfactorily completing a more advanced course in Russian.

out satisfactorily completing a more advanced course in Russian.

RUSS 102. SECOND COURSE IN STANDARD RUSSIAN. Class 3, Lab. 1, cr. 3. Prerequisite: RUSS 101. Continuation of RUSS 101.

Spanish

SPAN 101. FIRST COURSE IN SPANISH. Class 3, Lab. 1, cr. 3.

For students who have had no previous work in Spanish.

Unless recommended by the head of

the school in which the student is registered, a student may not apply toward graduation the credit for SPAN 101 without satisfactorily completing a more advanced course in Spanish.

SPAN 102. SECOND COURSE IN SPANISH. Class 3, Lab. 1, cr. 3. Prerequisite: SPAN 101. Continuation of SPAN 101.

SPAN 203. THIRD COURSE IN SPANISH. Class 3, cr. 3. Prerequisite: SPAN 102.

Readings from the works of nineteenth-century and contemporary Spanish writers; practice in speaking and writing Spanish.

SPAN 204. FOURTH COURSE IN SPANISH (READING). Class 3, cr. 3. Prerequisite: SPAN 203.

Primary emphasis on reading, but some practice in speaking.

SPAN 260. SPANISH PRONUNCIATION. Class 1, cr. 1. Prerequisite: SPAN 102 or equivalent. May be taken concurrently with SPAN 203, 204, or 261. Required of majors and minors in Spanish. Open to others on an elective basis.

The rudiments of phonetics as applied to the pronunciation of Spanish.

PHILOSOPHY

R. F. Grabau, Head of the Department

PHIL 110. INTRODUCTION TO PHILOSOPHY. Class 3, cr. 3.

The basic problems and types of philosophy with special emphasis upon the problems of knowledge and nature of reality.

PHIL 111. ETHICS. Class 3, cr. 3.

A study of the nature of moral value and obligation. Topics such as the following will be considered: different con-

ceptions of the good life and standards of right conduct; the regulation of non-moral and moral goodness; determinism, free will, and the problem of moral responsibility; the political and social dimensions of ethics; the principles and methods of moral judgment. Readings will be drawn both from contemporary sources and from the works of such philosophers as Plato, Aristotle, Aquinas, Butler, Hume, Kant, and J. S. Mill.

POLITICAL SCIENCE

M. Q. Hale, Head of the Department

Associate Professor: A. O. Bowser.

POL 101. AMERICAN GOVERNMENT AND POLITICS. Class 3, cr. 3.

A study of the nature of democratic government, the U.S. Constitution, federalism, civil rights, political dynamics, the presidency, Congress, and the judiciary.

POL 141. INTRODUCTION TO COMPARATIVE POLITICS. Class 3, cr. 3.

Introductory survey of major European governments, including mainly Great Britain, France, Germany, and the Soviet Union, with special attention to historical, cultural, and constitutional developments, the organization and ideologies of political parties, and current political problems.

POL 230. INTRODUCTION TO INTERNATIONAL RELATIONS. Class 3, cr. 3.

Introductory survey of the underlying forces in international relations, the foreign policies of the great powers, and agencies of control and cooperation.

POL 350. INTRODUCTION TO POLITICAL THEORY: THEORY AND CONCEPTS. Class 3, cr. 3. No prerequisites:

An analysis of the most important concepts found in the writings of outstanding political theorists from the time of the Greeks through the end of the Middle Ages with attention paid to writings of the Reformation period. An examination of two systems of political thought in the western political tradition: the Classical and the Christian. The idea of the theorists are studied in the light of the society and institutions of their time.

POL 370. INTRODUCTION TO COMPARATIVE STATE POLITICS. Class 3, cr. 3.

An introduction to the structure and process of state government, including the legal and political relationships between the state and local units of government.

POL 429. CONTEMPORARY POLITICAL PROBLEMS. Class 3, cr. 3. Prerequisite: POL 101 or 301. (Formerly POL 529.)

Contemporary political problems in the

United States affecting the interpretation of democracy, human rights and welfare, social pressures, intergovernmental relations.

POL 510. POLITICAL PARTIES AND POLITICS. Class 3, cr. 3.

A study of political leadership, pressure groups, political parties, nominating processes, campaign strategies, voting behavior, and money in elections.

PSYCHOLOGICAL SCIENCES

J. C. Naylor, Head of the Department

Associate Professor: J. W. Gaines.

PSY 120. ELEMENTARY PSYCHOLOGY. Class 3, cr. 3.

Introduction to the fundamental principles of psychology, covering particularly the topics of personality, intelligence, emotion, attention, perception, learning, memory, and thinking.

PSY 235. CHILD PSYCHOLOGY. Class 3, cr. 3. Prerequisite: PSY 120 or equivalent.

General principles of children's behavior and development, from conception to adolescence, including sensory and motor development, and basic psychological processes such as learning, motivation and socialization.

PSY 301. INTRODUCTION OF QUANTITATIVE TOPICS IN PSYCHOLOGY I. Sem. 1 and 2. Class 2, Lab. 2, cr. 3. Prerequisite: MA 213 or consent of instructor.

An introduction to the development and application of statistical, quantitative and measurement techniques, pertinent to the psychological sciences. Fundamental concepts of numerical assignment, sampling theory, distribution functions, experimental design, inferential procedures, and statistical control.

PSY 302. INTRODUCTION TO QUANTITATIVE TOPICS IN PSYCHOLOGY II. Sem. 1 and 2. Class 2, Lab. 2, cr. 3. Prerequisite: PSY 301 or consent of instructor.

Continuation of PSY 301. Fundamental concepts of test theory, introduction of applied psychological testing, the scaling of data, and an introduction to mathematical models of psychological phenomena.

PSY 303. EXPERIMENTAL PSYCHOLOGY. Sem. 1 and 2. Class 2, Lab. 2, cr. 3. Prerequisite: PSY 301 or equivalent.

The lecture portion of this course covers methodology and the philosophy of science, while the laboratory experience covers different techniques in several areas of experimental psychology.

PSY 310. SENSORY AND PERCEPTUAL PROCESSES. Class 3, cr. 3. Prerequisite: six hours of psychology.

Theory, problems, and research in sensation and perception, including physiological bases and measurement techniques.

PSY 311. MOTIVATION AND LEARNING. Class 3, cr. 3. Prerequisite: six hours of psychology.

History, theory, and research in motivation and learning.

PSY 340. GENERAL SOCIAL PSYCHOLOGY. Sem. 1 and 2. SS. Class 3, cr. 3. (Not open to students with credit for SOC 340.) Prerequisite: three hours of psychology or of sociology.

Conditions and consequences of human behavior in social situations, with emphasis upon the mechanism and the processes on the basis of which socialization takes place.

PSY 350. ABNORMAL PSYCHOLOGY. Class 3, cr. 3. Prerequisite: three hours of psychology.

Various forms of mental disorder from the standpoint of their origin, treatment, prevention, social significance, and relation to problems of normal human adjustment.

PSY 423. PSYCHOLOGY OF PERSONALITY. Class 3, cr. 3. Prerequisite: three hours of psychology.

The development, structure, and functioning of the normal personality.

PSY 500. STATISTICAL METHODS APPLIED TO PSYCHOLOGY, EDUCATION, AND SOCIOLOGY. Class 3, cr. 3.

Descriptive statistics and an introduction to sampling statistics. Application to psychological, sociological, and educational data.

SOCIOLOGY AND ANTHROPOLOGY

L. Z. Breen, Head of the Department

Assistant Professor: N. Kinzer.

ANTH 105. AN INTRODUCTION TO CULTURAL ANTHROPOLOGY. Class 3, cr. 3.

An introduction to the science of man and his works. Emphasis on the nature of culture and culture change; relationship of culture and personality. Attention given to the variations with the "universal" institutions of man: language, technology, the family, systems of social control, economics, warfare, religion, art, and values. Processes of invention, diffusion and acculturation; theoretical interpretations of the direction and process of cultural development.

SOC 100. INTRODUCTORY SOCIOLOGY. Class 3, cr. 3. May not be taken for credit by students of junior or senior standing.

A survey course designed to introduce the student to the science of human society. Fundamental concepts, description and analysis of society, culture, the socialization process, social institutions, and social change.

SOC 220. SOCIAL PROBLEMS. Class 3, cr. 3. Prerequisite: SOC 100 or 312, or equivalent.

Analysis of problem conditions in modern society—family disorganization, racial conflicts, class struggle, mental illness, narcotic addiction, gambling, alcoholism, and others. Social factors involved in the development, continued existence, and amelioration of these conditions.

SOC 312. AMERICAN SOCIETY. Class 3, cr. 3. Students with freshman standing (or who have had SOC 100) may not enroll in this course without special permission.

An introduction to sociological perspective. Detailed consideration of the fundamental structure, social changes, and related problems of the major American institutions: family, economic order, po-

litical organization, education, and religion.

SOC 340. GENERAL SOCIAL PSYCHOLOGY. Class 3, cr. 3. (Not open to students with credit for PSY 340.) Prerequisite: three hours of psychology or of sociology.

Conditions and consequences of human behavior in social situations, emphasis upon the mechanism and the processes on the basis of which socialization takes place.

SOC 350. SOCIAL PSYCHOLOGY OF MARRIAGE. Class 3, cr. 3. (Not open to students who have had CDFL 350.)

Designed to provide an understanding of contemporary courtship, marriage, and family interaction as cultural, social, and social-psychological phenomena. Consideration of the major sources of marital strain and conflict within a heterogeneous, rapidly changing society.

SOC 383. INTRODUCTION TO METHODS OF SOCIAL RESEARCH. Class 3, cr. 3. Prerequisite: six hours of sociology. (Formerly SOC 480.)

Introduction to the methods of data collection and analysis and to the use of the scientific method in social research.

Formulation of hypotheses and research designs for their testing. Elementary principles for the conduct of experiments, observation and interviewing, documentation, content analysis, and surveys. Relationship between social research and social theory.

SOC 422. CRIMINOLOGY. Class 3, cr. 3. Prerequisite: SOC 100, 312, or equivalent.

Nature and cause of crime; methods of dealing with adult and juvenile offenders; consideration of present programs for the social treatment of crime in the light of needed changes.

School of Industrial Management

Dean J. S. Day in Charge

ECONOMICS

P. H. Hendershott, Chairman of Policy Committee

Assistant Professors: T. J. Ising, R. A. Martin.

ECON 210. PRINCIPLES OF ECONOMICS.* Class 3, cr. 3.

Study of the basic economic institutions, such as business, labor organizations, banks, and government. Analysis of the effects of competition, monopoly, and government on allocation of resources in production and consumption; factors affecting size and growth of national income.

ECON 251. MICROECONOMICS. Class 3, cr. 3.
Prerequisite: ECON 210.

Price theory and resource allocation. Emphasis is on developing a detailed understanding of the principles of microeconomics and analysis and their application to understanding price and market behavior.

ECON 252. MACROFINANCE. Class 3, cr. 3.
Prerequisite: ECON 251.

Financial behavior of households, non-financial businesses, commercial banks and other financial institutions. The determination of interest rates and financial flows. The effect of these on eco-

nomie activity and the special role of Federal Reserve.

ECON 513. ECONOMIC THEORY. Class 3, cr. 3.

Theoretical analysis of a market economy with an emphasis on decision processes of managers. Consideration is given to microaspects of price determination, utilization of resources and market organization, and aggregative concepts of national income and employment.

ECON 553. LABOR LAW I. This course has been replaced by INDM 553.

ECON 554. LABOR LAW II. This course has been replaced by INDM 636.

ECON 585. THE UNITED STATES AND THE WORLD ECONOMY IN RECENT TIMES. Class 3, cr. 3. Limited to students in the Master of Arts in Teaching (Economics) Program.

Economic history of the United States with primary emphasis upon topics related to economic growth and development in the nineteenth and twentieth centuries.

INDUSTRIAL MANAGEMENT

E. A. Pessemier, Chairman of the Policy Committee

INDM 100. MANAGEMENT LECTURES. Class 1, cr. 1.

An introduction and survey of the field of industrial management.

INDM 200. INTRODUCTORY ACCOUNTING. Class 3, cr. 3 or Class 2, Lab. 2, cr. 3.

Introduction to the fundamentals of accounting.

INDM 201. COST ACCOUNTING. Class 3, cr. 3.
Prerequisite: INDM 200 or equivalent.

Nature of cost accounting; job order, process, and standard cost methods. Preparation and uses of various types of cost reports.

* Several economics courses generally cover the same material although they differ in detail in order to serve the needs of the several schools. ECON 210, 216, and 219 are oriented toward macroeconomics while ECON 212 and 215 are more concerned with microeconomics. Credit will be given for only one of ECON 210, 216, and 219 as well as only one of ECON 212 and 215.

INDM 310. FINANCIAL MANAGEMENT. Class 3, cr. 3. Prerequisite: INDM 201 or 202.

Management of the financial affairs of the industrial enterprise from the viewpoints of its financial officer.

INDM 320. MARKETING MANAGEMENT. Class 3, cr. 3. Prerequisite: INDM 201 or equivalent.

A managerial approach to marketing decisions. Emphasis on problems related to product policy, distribution channels, pricing, personal selling, advertising, and marketing research.

INDM 457. LEGAL FOUNDATIONS IN BUSINESS. Class 3, cr. 3. (Formerly ECON 472.) Prerequisite: senior standing in industrial management or consent of department.

Nature of our legal system and its significance for management. Social and moral basis of law, nature and enforcement of legal liability. Cases dealing with contracts, torts, negotiable instruments, and related topics.

INDM 553. LABOR LAW I. Class 3, cr. 3. Prerequisite: INDM 430 or consent of instructor. (Formerly ECON 553.)

A study of the common law and statutory law affecting union-manage-

ment relations, with emphasis on current labor legislation including such areas as the National Labor Relations Act and amendments, the Railway Labor Act, wage and hour legislation, workmen's compensation, and social security laws.

INDM 554. LABOR LAW II. (This course has been replaced by INDM 636).

INDM 600. FINANCIAL CONTROL I. Class 2, Lab. 2, cr. 3.

For students in the graduate management program or by consent of the school. Basic concepts of accounting and their use in management.

INDM 601. FINANCIAL CONTROL II. Cr. 3. For students in the graduate management program or by consent of the school.

Continuation of Financial Control I. An intensive study of the use of cost and financial figures as a tool in planning and controlling business operations.

INDM 631. THE PERSONNEL FUNCTION. Class 3, cr. 3. For graduate students only except by permission of instructor.

Study of the administration of the industrial relations function in the business firm. Role of line and staff in manpower and management.

School of Pharmacy and Pharmacal Sciences

Dean V. E. Tyler in Charge

PCOL 201. PHARMACOLOGY FOR NURSES. Class 3, cr. 3.

An introduction to the pharmacological basis of therapeutics.

School of Science

Dean F. Haas in Charge

BIOLOGICAL SCIENCES

H. Koffler, Head of the Department

Associate Professors: C. L. Porter, M. W. Woodard.

Assistant Professor: G. T. Asteriadis.

Instructor: K. Miller.

BIOL 103. PRINCIPLES OF BIOLOGY. Class 2, Lab. 2, cr. 3.

The nature of the living state, and experimental approaches in studying it.

BIOL 104. PRINCIPLES OF BIOLOGY. Class 2, Lab. 2, cr. 3.

Continuation of BIOL 103.

BIOL 108. INTRODUCTION TO BOTANY. Class 2, Lab. 4, cr. 4.

Introduction to the growth, functioning, structures, heredity, diversity of plants, and their interactions with the environment.

BIOL 109. INTRODUCTION OF ZOOLOGY. Class 2, Lab. 4, cr. 4.

Introduction to the structure, functioning, heredity, development, classification, and evolution of animals, and their interactions with the environment.

BIOL 203. BIOLOGY OF MAN. Class 2, Lab. 2, cr. 3.

Introduction to human biology with emphasis on anatomy and physiology.

BIOL 204. BIOLOGY OF MAN. Class 2, Lab. 2, cr. 3.

Continuation of BIOL 203.

BIOL 205. BIOLOGY FOR ELEMENTARY SCHOOL TEACHERS. Sem. 1. Class 2, Lab. 2, cr. 3.

Unifying concepts of biology taught with materials appropriate for future elementary school teachers.

BIOL 206. BIOLOGY FOR ELEMENTARY SCHOOL TEACHERS. Class 2, Lab. 2, cr. 3.

Continuation of BIOL 205.

BIOL 211. THE SOCIAL IMPACT OF THE BIOLOGICAL SCIENCES. Class 2, Lab. 2, cr. 3.

An introduction to basic concepts, experimentation, and information found within the biological sciences. Emphasis is placed upon the role of biology within the social framework. Relationships between this discipline and common social problems are explored.

BIOL 212. THE SOCIAL IMPACT OF THE BIOLOGICAL SCIENCES. Class 2, Lab. 2, cr. 3.

A continuation of BIOL 211.

BIOL 220. INTRODUCTION TO MICROBIOLOGY.

Class 2, Lab. 2, cr. 3. Prerequisites: one year of general chemistry and one semester of a life science.

The isolation, growth, structure, functioning, heredity, identification, classification, and ecology of microorganisms, their role in nature and significance to man.

BIOL 221. INTRODUCTION TO MICROBIOLOGY.

Class 2, Lab. 2, Rec. 1, cr. 4. Prerequisites: one year of general chemistry and one semester of a life science.

The isolation, growth, structure, functioning, heredity, identification, classification, and ecology of microorganisms, their role in nature and significance to man.

BIOL 260. STRUCTURAL BIOLOGY. Class 2, cr.

2. Prerequisites: BIOL 103 and 104 or 108 and 109 or equivalent; prerequisite or corequisite: BIOL 261.

A description of biological structure at diverse levels of organization from molecules to multi-cellular organisms with emphasis on the relationship of structure and function.

BIOL 261. LABORATORY IN STRUCTURAL BIOLOGY.

Lab. 4, cr. 2. Prerequisites: BIOL 103 and 104 or 108 and 109 or equivalent.

Structure of plants and animals with emphasis on comparative, phylogenetic, and functional relationships.

BIOL 285. ENVIRONMENTAL BIOLOGY. Lect. 1,

Rec. 1, Lab. 3, cr. 3. Prerequisites: a year of life science and a year of general chemistry.

Interactions of the biotic and abiotic components of natural environments. Ecological principles and phenomena associated with populations, communities, and ecosystems. Natural selection and other aspects of evolution. Principles of conservation.

BIOL 295. SPECIAL ASSIGNMENTS. Cr. arrange.

Reading, discussions, written reports or laboratory work selected for enrichment in special areas of the biological sciences. Consent of instructor required. May be repeated for credit.

CHEMISTRY

J. F. Foster, Head of the Department

Associate Professor: H. D. Murdock.

Assistant Professor: R. M. Hawthorne.

CHM 111. GENERAL CHEMISTRY. Class 2, Lab. 3, cr. 3.

Required for all freshmen registered in the School of Agriculture or in biology options of the School of Science who are not in CHM 115 or 117.

CHM 112. GENERAL CHEMISTRY. Class 2, Lab. 3, cr. 3.

Continuation of CHM 111.

CHM 115. GENERAL CHEMISTRY. Class 3, Lab. 3, cr. 4.

Required of students majoring in chemistry, physics, and engineering who do not take CHM 117-126.

Laws and principles of chemistry, with special emphasis on topics of importance in engineering. Numerical problems and relationships are introduced whenever quantitative treatment is possible.

CHM 116. GENERAL CHEMISTRY. Class 3, Lab. 3, cr. 4.

A continuation of CHM 115.

CHM 119. GENERAL CHEMISTRY. Class 2, Lab. 3, cr. 3.

A survey of general chemistry with emphasis on topics of importance to biology. Offered only for students in the technology programs.

CHM 255. ORGANIC CHEMISTRY. Class 3, cr. 3. Prerequisite: CHM 108, 110, 112, 116, or 118.

CHM 255L. ORGANIC CHEMISTRY LABORATORY. Lab. 3, cr. 1.

Laboratory experiments to accompany CHM 255.

CHM 256. ORGANIC CHEMISTRY. Class 3, cr. 3.

Continuation of CHM 255.

CHM 256L. ORGANIC CHEMISTRY LABORATORY. Lab. 3, cr. 1.

Laboratory experiments to accompany CHM 256.

COMPUTER SCIENCES

S. D. Conte, Head of the Department

CS 220. INTRODUCTION TO ALGORITHMIC PROCESSES. Class 3, cr. 3. Corequisite: one semester of mathematics beyond MA 151. Not open to students with credit in CS 210.

Introduction to the intuitive notion of an algorithm; representation of algorithms in narrative form as flow charts and as computer programs; general struc-

ture of computers; computers experience using a procedure-oriented language in programming algorithms such as those used in elementary numerical calculations, sorting, stimulation of a random process and symbol manipulation; definition and use of functions, subroutines and iterative procedures; survey of a variety of significant uses of computers.

GEOSCIENCES

Gunnar Kullerud, Head of the Department

The following courses are administered by the Department of Physics.

GEOS 261. THE SOLAR SYSTEM. Sem. 1, Class 3, cr. 3.

A descriptive nonmathematical presentation of the results of modern astronomy, together with historical background.

GEOS 262. STELLAR ASTRONOMY. Sem. 2, Class 3, cr. 3.

A descriptive nonmathematical presentation of the results of modern astronomy, together with historical background.

DIVISION OF MATHEMATICAL SCIENCES

M. Jerison, Head of the Department

Acting Section Chairman: L. E. Bednar

Associate Professor: L. A. Machtinger.

Assistant Professors: L. E. Bednar, R. Weatherwax.

Instructors: M. Kasper, D. Lauer.

MA 2. PLANE GEOMETRY. Class 5, cr. 0. Credit: one unit for admission.

MA 111. ALGEBRA. Class 3, cr. 3. (On West Lafayette Campus, given only for applied technology curricula. Not transferable from regional campuses except in applied technology curricula.)

This course satisfies the one unit of algebra required for admission.

MA 112. TRIGONOMETRY. Class 3, cr. 3. Not open to students with credit in MA 151 or 153.

For freshmen and others with two units of high school algebra.

MA 123. ELEMENTARY CONCEPTS OF MATHEMATICS I. Class 3, cr. 3. Not open to students with credit in MA 133.

Numeration systems; natural numbers; mathematical systems; mathematical reasoning; elementary set theory; elementary logic; mathematical proof; the number system of arithmetic; arithmetic algorithms.

MA 124. ELEMENTARY CONCEPTS OF MATHEMATICS II. Class 3, cr. 3. Prerequisite: MA 123. Not open to students with credit in MA 133.

The system of integers; rational numbers; polynomials; the real and complex number systems; elements of plane geometry; relations, functions, and graphs; elements of analytic geometry.

MA 130. MATHEMATICS FOR ELEMENTARY TEACHERS I. Class 3, cr. 3. Not open to students with credit in MA 123.

Numeration systems; finite mathematical systems; abstract mathematical systems, groups, fields; natural numbers through rationals, a structural approach, properties, algorithms; mathematical reasoning and proof.

The sequence MA 130-131-132 fulfills the mathematical requirements for elementary education majors. MA 123-124 may be substituted for 130 in meeting this requirement.

MA 131. MATHEMATICS FOR ELEMENTARY TEACHERS II. Class 3, cr. 3. Prerequisite: MA 130 or 124.

Informal study of metric and non-metric properties of geometric figures (primarily in a plane), measurement; introduction to foundations of Euclidean geometry.

The sequence MA 130-131-132 fulfills the mathematics requirements for elementary education majors. MA 123-124 may be substituted for 130 in meeting this requirement.

MA 132. MATHEMATICS FOR ELEMENTARY TEACHERS III. Class 3, cr. 3. Prerequisite: MA 130. Open only to students majoring in elementary education. Offered for the first time in the summer of 1972.

Integers, rationals, reals, a structural approach with proofs; algorithms, decimal and fractional notation; probability.

MA 147. ALGEBRA AND TRIGONOMETRY FOR TECHNOLOGY I. Class 3, cr. 3.

College algebra and trigonometry for technology students. Does not carry credit toward graduation in the Schools of Engineering or the Division of Mathematical Sciences.

MA 148. ALGEBRA AND TRIGONOMETRY FOR TECHNOLOGY II. Class 3, cr. 3.

Continuation of MA 147. Not open to students with credit in MA 150. Does not carry credit toward graduation in the Schools of Engineering or the Division of Mathematical Sciences.

MA 150. MATHEMATICS FOR TECHNOLOGY. Class 5, cr. 5. Not open to students with credit in MA 147 or 148.

College algebra and trigonometry for technology students. Does not carry credit toward graduation in the Schools of Engineering or the Division of Mathematical Sciences.

MA 151. ALGEBRA AND TRIGONOMETRY. Class 5, cr. 5. Not open to students with credit in MA 153 or 154.

College algebra and trigonometry for students with inadequate preparation for MA 163. Does not carry credit toward graduation in the Schools of Engineering or the Division of Mathematical Sciences.

MA 153. ALGEBRA AND TRIGONOMETRY I. Class 3, cr. 3. Not open to students with credit in MA 151.

MA 153-154 is a two-semester version of 151. Does not carry credit toward graduation in the Schools of Engineering or the Division of Mathematical Sciences.

MA 154. ALGEBRA AND TRIGONOMETRY II. Class 3, cr. 3. Not open to students with credit in MA 151. Continuation of MA 153.

Does not carry credit towards graduation in the Schools of Engineering or the Division of Mathematical Sciences.

MA 163. INTEGRATED CALCULUS AND ANALYTIC GEOMETRY I. Class 5, cr. 5. Not open to students with credit in MA 161, 171.

Topics from plane analytic geometry. Introduction to differentiation and integration. Applications.

Designed for students with incomplete background in analytic geometry.

MA 164. INTEGRATED CALCULUS AND ANALYTIC GEOMETRY II. Class 5, cr. 5.

Continuation of MA 163. Completion of introductory study of topics in plane analytic geometry and the calculus of one variable.

MA 213. FINITE MATHEMATICS I. Class 3, cr. 3. Prerequisite: MA 151 or equivalent.

Elementary logic, basic set theory, finite mathematical models, elementary probability theory. Applications to problems in the biological and social sciences.

MA 214. FINITE MATHEMATICS II. Class 3, cr. 3. Prerequisite: MA 213.

Simultaneous linear equations, matrices, and vectors, linear programming, game theory. Applications to problems in the biological and social sciences.

MA 223. INTRODUCTORY ANALYSIS I. Class 3, cr. 3. Prerequisite: MA 151 or equivalent. Should be preceded by MA 214. Not open to students with credit in MA 162 or 171.

Differential and integral calculus of one variable. Applications to problems in the biological and social sciences.

MA 224. INTRODUCTORY ANALYSIS II. Class 3, cr. 3. Prerequisite: MA 221. Not open to students with credit in MA 172 or 261.

Partial derivatives; differentials; multiple integrals; introduction to differential equations. Applications to problems in the biological and social sciences.

MA 261. MULTIVARIATE CALCULUS. Class 4, cr. 4. Prerequisite: MA 162.

Calculus: Indeterminate forms, parametric equations, solid analytic geometry, partial differentiation, multiple integrals, infinite series.

MA 262. LINEAR ALGEBRA AND DIFFERENTIAL EQUATIONS. Class 4, cr. 4. Prerequisite: MA 261.

Calculus: Linear algebra, elements of differential equations.

MA 351. ELEMENTARY LINEAR ALGEBRA. Class 3, cr. 3. Prerequisite: MA 261.

Systems of linear equations, finite dimensional vector spaces, matrices, determinants, applications to analytic geometry.

MA 361. ADVANCED CALCULUS AND DIFFERENTIAL EQUATIONS. Class 3, cr. 3. Prerequisite: MA 351.

Eigenvalues, partial differentiations, total differential, maxima and minima, line integrals, differential equations.

MA 453. ALGEBRA I. Class 3, cr. 3. Prerequisite: MA 351, or consent of instructor. MA 453 and 454 are primarily for mathematics majors.

Fundamental properties of integers, polynomials, groups, rings, fields.

MA 547. ANALYSIS FOR TEACHERS I. Class 3, cr. 3. Prerequisite: MA 261.

Inequalities, sequences, functions, limits. Application to such basic concepts as length and area and their implications for the teacher of mathematics. The real number system and topology of the real line.

MA 548. ANALYSIS FOR TEACHERS II. Class 3, cr. 3. Prerequisite: MA 547.

Elementary functions and basic theorems of calculus.

MA 550. ALGEBRA FOR TEACHERS I. Class 3, cr. 3. Prerequisite: MA 351 or graduate standing.

Definitions and elementary properties of groups, rings, integral domains, fields, vector spaces, and matrices, with major emphasis on the rings of integers, ra-

tional numbers, complex numbers and polynomials. Intended primarily for secondary school teachers.

MA 551. ALGEBRA FOR TEACHERS II. Class 3, cr. 3. Prerequisite: MA 550.
A continuation of MA 550.

MA 556. INTRODUCTION TO THE THEORY OF NUMBERS. Class 3, cr. 3. Prerequisite: MA 261.

Divisibility, congruences, quadratic residues, Diophantine equations, the sequence of primes.

STATISTICS

S. S. Gupta, Head of the Department

STAT 401. ELEMENTARY STATISTICAL METHODS I. Class 3, cr. 3. Prerequisite: College algebra. Not open to students in the Division of Mathematical Sciences and Engineering.

A basic introductory statistics course with applications shown to various fields and emphasis placed on assumptions, ap-

MA 563. ADVANCED GEOMETRY. Class 3, cr. 3.

A critique of Euclid's *Elements* and a detailed study of Hilbert's postulates with an introduction to non-Euclidean geometry. Primarily for prospective secondary school teachers.

MA 581. INTRODUCTION TO LOGIC FOR TEACHERS. Class 3, cr. 3. Prerequisites: MA 351 and 361.

Sentential and general theory of inference and nature of proof: elementary axiom systems.

plicability, and interpretations of various statistical techniques. Subject matter includes frequency distributions, descriptive statistics, elementary probability, normal distribution applications, sampling distribution, estimation, hypothesis testing, and linear regression.

PHYSICS

E. C. Fowler, Head of the Department

Assistant Professors: W. Brill, V. J. Raelson.

PHYS 152. MECHANICS. Class 4, Lab. 2, cr. 4. Prerequisite or corequisite: MA 164 or equivalent.

Statics; uniform and accelerated motion; Newton's laws; circular motion; energy, momentum, and conservation principles; dynamics of rotation; gravitation and planetary motion; hydrostatics and hydrodynamics; simple harmonic and wave motion; sound.

PHYS 205. SURVEY OF PHYSICS. Class 5, cr. 4. Prerequisite: MA 111 or equivalent.

General physics for students of agriculture and forestry.

PHYS 210. THE NATURE OF PHYSICAL SCIENCE I. Class 2, Lab. 3, cr. 3.

Development of basic concepts and theories in physical science; a terminal course.

PHYS 220. GENERAL PHYSICS. Class 3, Lab. 2, cr. 4. Prerequisites: MA 111 and 112, or 151, or equivalent.

Mechanics, heat, and sound for students not specializing in physics.

PHYS 221. GENERAL PHYSICS. Class 3, Lab. 2, cr. 4. Prerequisite: PHYS 220.

Electricity, light, and modern physics for students not specializing in physics.

PHYS 251. HEAT, ELECTRICITY, AND OPTICS. Class 5, Lab. 2, cr. 5. Prerequisite: PHYS 152.

Heat, kinetic theory, elementary thermodynamics, heat transfer. Electrostatics, current electricity, electromagnetism, magnetic properties of matter; geometrical and physical optics.

PHYS 342. MODERN PHYSICS. Class 4, cr. 3. Prerequisite: PHYS 241, 251, or 261.

A survey of basic concepts and phenomena in atomic, nuclear, and solid state physics.

School of Technology

Dean G. W. McNelly in Charge

ARCHITECTURAL TECHNOLOGY

D. D. Moss, in Charge of Curriculum

Assistant Professor: H. S. Driggs.

ART 120. FREEHAND DRAWING I. Lab. 6, cr. 2.

Development of freehand sketching, using pencil, charcoal and ink, as a means of communication with an emphasis on architectural subjects.

ART 150. ARCHITECTURAL CONSTRUCTION I. Lab. 9, cr. 3. (Evening Divisions: Lab. 6, cr. 3, with outside assignments required.) Prerequisite: ART 116 or EG 110.

A study of wood frame construction through a semester project requiring planning, preliminary and working drawings, and a model of the framing system. Field trips may be included.

ART 162. BUILDING MATERIALS AND METHODS. Class 1, Lab. 3, cr. 2.

Properties and use of various building materials in modern construction, and an introduction to the skills and methods related to their erection.

ART 164. BUILDING MATERIALS. Class 2, cr. 2.

Properties and use of materials as found in building construction.

ART 172. SYSTEMS OF CONSTRUCTION. Class 2, cr. 2.

A survey of the organization of the construction industry, and introduction to various building components and systems with emphasis on a non-mathematical study of structural systems.

ART 210. HISTORY OF ARCHITECTURE I. Class 3, cr. 3.

Survey of styles and influences of cultures which led to the development of architecture from the earliest times to the present day.

ART 220. FREEHAND DRAWING II. Lab. 6, cr. 2.

Continuation of ART 120. The study of color theory and the use of color techniques in architectural presentations.

ART 222. ARCHITECTURAL CONSTRUCTION II.

Lab. 9, cr. 3. (Evening Divisions: Lab. 6, cr. 3, with outside assignments required.) Prerequisite: ART 150.

Preparation of preliminary and working drawings for an intermediate-sized commercial or institutional building.

ART 224. ARCHITECTURAL CONSTRUCTION III.

Lab. 9, cr. 3. (Evening Divisions: Lab. 6, cr. 3, with outside assignments required.) Prerequisite: ART 222.

Continuation of ART 222 with emphasis on larger and more complex structures.

ART 276. SPECIFICATIONS AND CONTRACT DOCUMENTS. Class 2, cr. 2.

Preparation of general conditions and major phases of building construction specifications, study agreements, contracts, liens, and bonds.

ART 284. MECHANICAL EQUIPMENT OF BUILDINGS. Class 3, cr. 3.

A study of plumbing, heating and air-conditioning for residential and commercial buildings. Water supply and drainage systems, heat loss and heat gain, heating systems, and air-conditioning systems.

ART 285. ELECTRICITY FOR BUILDINGS. Class 2, cr. 2.

A survey of electrical and lighting requirements for residential and commercial buildings. Lighting fundamentals and design, electric circuits, power requirements, and wiring layout.

CIVIL ENGINEERING TECHNOLOGY

D. D. Moss, in Charge of Curriculum

Assistant Professor: R. L. Taylor.

CET 104. ELEMENTARY SURVEYING. Class 2, Lab. 3, cr. 3. Prerequisite or co-requisite: MA 112 or 150 or equivalent.

Measurement of distances, elevations,

directions and angles, using tape, level, compass, and transit. Computation of areas, traverses, lines, and grades.

CET 160. STATICS. Class 3, cr. 3. Prerequisite: MA 154 or equivalent.

A study of forces acting on bodies at rest, including coplanar and noncoplanar forces, concurrent and nonconcurrent forces, friction forces, and hydrostatic forces. Centroids and moments of inertia are included. Practice in use of the slide rule will be included.

CET 208. ROUTE SURVEYING. Class 1, Lab. 3, cr. 2. Prerequisite: CET 104.

Preliminary and construction surveys for highways and railroads, including simple, compound, reverse, and easement curves, superelevation of curves, profiles, grade lines, slope stakes, yardage estimates, and mass and haul diagrams.

CET 209. LAND SURVEYING AND SUBDIVISION. Class 1, Lab. 6, cr. 3. Prerequisite: CET 104.

Theory and practice of land surveying, subdivision, filing and recording deeds, United States government survey of public lands, law of land surveying, descriptions and area computations for land surveys. Subdivision planning calculations and plotting, water main layouts, storm and sanitary sewer calculations and layouts. Street plans and profiles.

CET 253. HYDRAULICS AND DRAINAGE. Class 3, cr. 3. Prerequisite: GNT 136.

Basic fluid statics, Bernoulli's equation, flow in water lines and sewer lines, overland and ditch drainage, and culvert size determination.

CET 260. STRENGTH OF MATERIALS. Class 3, cr. 3. Prerequisite: CET 160.

Study of stress-strain relationships, shear and bending moment diagrams, stresses and deflections of beams, axial loads, and combined stresses. Applied problems in the field of structural design.

CET 280. STRUCTURAL CALCULATIONS. Class 3, cr. 3. Prerequisite or corequisite: CET 260 or MET 212.

Graphic analysis of trusses and beams, including stress diagrams, graphical shear and bending moment diagrams, and sizing of structural members.

CET 299. CIVIL ENGINEERING TECHNOLOGY. Cr. 1-4.

Hours to be arranged with the staff. Primarily for third and fourth semester students. Subject matter to be assigned by the staff.

COMPUTER TECHNOLOGY

Associate Professor: L. F. Boness.

Assistant Professors: W. H. Evans, J. Gallagher.

CPT 100. COMPUTER UTILIZATION. Class 3, cr. 3.

An introduction to data processing techniques through the use of unit record and highspeed computer equipment. Emphasis will be on how computers can assist the potential user.

CPT 115. INTRODUCTION TO DATA PROCESSING. Class 4, Lab. 2, cr. 5. Not open to students with credit in CPT 116 or 127.

An introduction to computers and data processing. The historical development of unit record equipment and electronic digital computers; an introduction to unit record equipment, machine language, assembly language, compiler languages; and a survey of computer applications.

CPT 116. INTRODUCTION TO DATA PROCESSING I. Class 3, cr. 3. Not open to students with credit in CPT 115.

CPT 116-117 is a two-semester version of CPT 115.

CPT 117. INTRODUCTION TO DATA PROCESSING II. Class 2, Lab. 2, cr. 3. Not open to students with credit in CPT 115. Continuation of CPT 116.

CPT 122. COMPUTER MATH. Class 3, cr. 3. Prerequisite or corequisite: MA 147 or 150.

Selected topics in mathematics that are related to business and computer computations. Topics include: symbolic logic, binary, octal and hexadecimal number systems; determinates; matrices and linear systems.

CPT 133. ASSEMBLY LANGUAGE PROGRAMMING I. Class 3, Lab. 2, cr. 4. Prerequisite: CPT 115 or CPT 116.

CPT 134. ASSEMBLY PROGRAMMING II. Class 3, Lab. 2, cr. 4. Prerequisite: CPT 131.

Advanced symbolic programming techniques, programming exercises and case studies are designed to familiarize the student with actual programming practices and to bridge the gap from the theoretical to the real world of data processing.

CPT 198. DATA PROCESSING PRACTICE I. Cr. 1.

Practice in industry with written reports of this practice for co-op students. May be repeated once.

CPT 200. COMPUTER PROGRAMMING FUNDAMENTALS. Class 2, Lab. 2, cr. 3.

The presentation of the basic elements of programming digital computers. There is a treatment of absolute and symbolic coding, magnetic tape functions, and random access processing. Major emphasis will be on compiler language (FORTRAN) programming.

CPT 220. NUMERICAL ANALYSIS I. Class 2, Lab. 2, cr. 3. Prerequisites: MA 150 and CPT 264.

Numerical methods necessary for finding solutions to mathematical equations and for analysis of tabulated data. A laboratory course consisting chiefly of the solution of specific problems by computer programming and other methods. Topics include: iterative and direct solutions of linear equations, matrix operations, and error analysis.

CPT 225. STATISTICAL METHODS. Class 3, cr. 3. Prerequisite or corequisite: CPT 264.

An introduction to elementary statistics with emphasis on the analysis of actual data. Topics include: description and representation of sample data, probability, theoretical distributions, sampling, estimating, correlation, regression, and computer statistical routines.

CPT 254. COMMERCIAL SYSTEMS APPLICATIONS. Class 3, cr. 3. Prerequisites: CPT 133, IET 104, and INDM 200.

An introduction to the problems of developing integrated data processing systems for more efficient handling of the

data flow in modern business. The student will produce reports needed by management, prepare flowcharts, design forms, and write procedures for designated systems.

CPT 261. RPG PROGRAMMING. Class 2, Lab. 2, cr. 3.

Computer programming using RPG, Report Program Generator. Study of the language structure, applications, and related utility programs.

CPT 264. FORTRAN PROGRAMMING. Class 2, Lab. 2, cr. 3. Prerequisite: CPT 133; prerequisite or corequisite: MA 150.

The structure and details of FORTRAN, a mathematically oriented compiler language. Numerous problems are solved on the computer to demonstrate the many facets of the language.

CPT 265. COBOL PROGRAMMING. Class 2, Lab. 2, cr. 3. Prerequisite: A prior programming course.

A study of the programming language, COBOL, which is oriented toward data handling and processing tasks. The student will study the structure and details of COBOL and perform programming exercises as well as consider practical applications.

CPT 286. COMPUTER OPERATING SYSTEMS I. Class 2, Lab. 2, cr. 3. Prerequisites: CPT 132 and CPT 264.

An introduction to the computer operating systems and other systems software. Topics include: utility programs, job control monitors, program supervisors, loaders and link editors.

CPT 294. COMPUTER SEMINAR. Class 2, cr. 1. Prerequisite: An introductory computer course.

Current problems and issues in the computer field. Field trips are required.

CPT 299. COMPUTER TECHNOLOGY. Cr. 1-4. May be repeated for credit up to nine hours.

Hours and credit to be arranged. Primarily for students who desire to execute a project from start to finish on the computer.

CONSTRUCTION TECHNOLOGY

D. D. Moss, in Charge of Curriculum

CNT 280. QUANTITY SURVEY AND ESTIMATING. Class 2, Lab. 3, cr. 3. Prerequisite: ART 150.

A study of methods to estimate quantities of materials required in construction. Practice in making quantity surveys. Introduction to estimating labor and costs.

ELECTRICAL ENGINEERING TECHNOLOGY

G. L. Rainey, Head of the Department

Assistant Professor: W. L. Stoakes.

EET 15. BASIC ELECTRICITY. Class 2, Lab. 4, cert. units 4.

Basic electrical terms, units, symbols, and schematics are discussed. Equipment such as voltmeters, ohmmeters, ammeters, generators, and oscilloscopes are demonstrated. Magnetism, inductance, capacitance series and parallel circuits are considered. Basic principles of alternating current, capacitive reactance, inductive reactance, impedance, phasors, power factor, and resonance are studied.

EET 23. TRANSISTOR AND VACUUM TUBE FUNDAMENTALS. Class 2, Lab. 4, cert. units 4.

Transistor fundamentals, semiconductor diodes, vacuum tube diodes, triodes, tetrodes, pentodes, are discussed. The use of oscilloscopes, audio oscillators, and voltmeters in electronic circuits such as amplifiers, power supplies, and oscillators is considered.

EET 39. ELECTRONIC CIRCUITS. Class 2, Lab. 4, cert. units 4.

Transistors and vacuum tubes used in circuits are considered. Power supply circuits, audio amplifiers, RF amplifiers, oscillators, modulation, AM transmitters and receivers, FM transmitters and receivers are discussed. Special electronic circuits such as clippers, clampers, multi-vibrators, blocking oscillators, sweep circuits are studied. Troubleshooting techniques are emphasized.

EET 41. ELECTRONIC CONTROL CIRCUITS. Class 2, Lab. 4, cert. units 4.

Rotating electrical machinery and control circuits, servomechanism components such as error detectors, amplifiers, detectors, magnetic amplifiers are considered. Specialized electronic control circuits are discussed.

EET 45. COMMUNICATIONS ELECTRONICS. Class 2, Lab. 4, cert. units 4.

Principles of television, UHF, microwaves, transmitters and receivers, FCC exam information, troubleshooting techniques are considered.

EET 101. ELECTRICAL CIRCUITS I. Class 3, cr. 3. Prerequisites or corequisites: MA 150, EET 113.

A study of DC and AC electrical circuits, Ohm's Law, Kirchhoff's Laws, series and parallel circuits, power, magnetic circuits, switches, relays, inductance, capacitance, alternating voltages and currents, transformers, reactance, impedance, phase relationships, resonance, and an introduction to network theorems.

EET 103. ELECTRONICS I: VACUUM TUBES AND TRANSISTORS. Class 2, cr. 2. Prerequisite or corequisite: EET 101 or equivalent.

Introduction to electron tubes, transistors, and solid state diodes. A study of the physical structure and materials as well as operation and static characteristics of the diode, triode, tetrode, and pentode vacuum tubes. A study of semiconductor materials, diodes, and transistor static characteristics and an introduction to amplifiers. Also orientation on university organization and industrial careers.

EET 113. ELECTRICAL ENGINEERING TECHNOLOGY LABORATORY I. Lab. 6, cr. 2. Prerequisites or corequisites: EET 101 and EET 103.

The first of a sequence of practical laboratory courses designed to develop technical skills and techniques in circuit construction, instrument operation, testing, measuring, troubleshooting, and circuit analysis. Instruments such as ammeters, voltmeters, ohmmeters, DC bridges, and oscilloscopes are used in DC and AC circuits.

EET 151. ELECTRICAL CIRCUITS II. Class 3, cr. 3. Prerequisite: EET 113; prerequisite or corequisite: MA 221.

A continuation of EET 101. The study of inductance; capacitance; network theorems; AC circuits using phasors, rectangular and polar forms; transformers; coupled circuits; nonsinusoidal voltages; transients, and polyphase circuits.

EET 153. ELECTRONICS II. Class 3, cr. 3. Prerequisite or corequisite: EET 151.

The application of electron tubes, transistors and other solid state devices in electronic circuits. A study of rectifiers, equivalent circuits, voltage amplifiers, tuned amplifiers, oscillators, and diode logic circuits. Introduction to AM and FM receivers and transmitters.

EET 163. ELECTRICAL ENGINEERING LABORATORY II. Lab. 6, cr. 2. Prerequisite or corequisite: EET 153.

The second of a sequence of practical laboratory courses designed to develop technical skills and techniques in circuit construction, testing, instrument operation, measuring, troubleshooting and circuit analysis. Experimental work on transistors and electron tube circuits, DC and AC networks, and electromechanical devices, using ammeters, voltmeters, wattmeters, oscilloscopes, signal generators, wavemeters, frequency meters, and bridges.

EET 203. ELECTRONICS III. Class 3, cr. 3. Prerequisite: EET 163.

The study of regulated power supplies, polyphase rectifiers, filters, AM receivers and transmitters, FM receivers and transmitters, waveshaping, clippers, choppers, peakers, multivibrators, blocking oscillators, and logic circuits.

EET 211. ELECTRICAL POWER AND MACHINERY. Class 3, cr. 3. Prerequisite: EET 163.

A first course in machinery including small generators and motors as related to applications in electronic and servo systems. The study of DC machines and AC single- and multi-phase synchronous and induction machines.

EET 213. ELECTRICAL ENGINEERING TECHNOLOGY LABORATORY III. Lab. 6, cr. 2. Prerequisites or corequisites: EET 203 and EET 211.

The third of a sequence of practical laboratory courses designed to develop technical skill and techniques in circuit

construction, testing, instrument operation, measuring, troubleshooting, and circuit analysis. Experimental work and measurements on power supply circuits, filters, receivers, transmitters, electrical machines, waveshaping, circuits, sweep circuits, logic circuits and commercial equipment and selected experiments from the student's specialty.

EET 216. ELECTRICAL MACHINES AND CONTROLS. Class 3, cr. 3. Prerequisites: MA 150 and PHY 221 or equivalent.

Lecture, recitation, and demonstration are combined to acquaint the student with the elements of electrical circuits and machines as they are applied as component parts of machine drives and controls within the requirements of the National Electrical Code and in conformity to the ratings and dimensional specifications of NEMA. Manufacturers catalogs and pamphlets are used freely as classroom aids.

EET 253. ELECTRONICS IV. Class 3, cr. 3. Prerequisite: EET 213.

A study of the applications of the fundamental electrical and electronic circuits in various specialty areas. Includes selected topics such as oscillators, synchronizing and sweep circuits, high-voltage power supplies, wide-band amplifiers, closed-loop feedback systems, transmission lines, UHF, VHF, radar, digital circuits, medical electronics, magnetic amplifiers, and lasers.

EET 263. ELECTRICAL ENGINEERING TECHNOLOGY LABORATORY IV. Lab. 3, cr. 1. Prerequisite or corequisite: EET 253.

Selected experiments to provide a broad technical background. Experiments are selected from specialty areas such as communications, electrical power, television, computers, medical electronics, automatic controls, and aviation electronics.

EET 301. ELEMENTS OF MACHINE CONTROL. Class 3, cr. 3. Prerequisite: EET 211.

The study of AC and DC machine controls. Includes relays, protective relays, circuit breakers, controllers and contractors.

EET 302. ELECTRO-MECHANICAL CONTROL COMPONENTS. Class 3, cr. 3. Prerequisites or corequisites: EET 203 and EET 211.

A study of the components in open-loop and closed-loop systems. Included

are sensing devices, error detectors, potentiometers, synchros, resolves, modulators, demodulators, amplifiers, motors, generators, and networks. An analysis course that stresses operation, time- and frequency-response characteristics, and proper adjustment of the components.

EET 303. COMMUNICATIONS I. Class 3, cr. 3. Prerequisite or corequisite: EET 203.

An advanced study of AM and FM modulation, receivers, transmitters, networks, filters, antennas, transmission lines, and television.

EET 306. TELEVISION I. Class 3, cr. 3. Prerequisite or corequisite: EET 213.

A study of television transmission and receiving system. Includes analysis of transmitted signal, FM, video amplifiers, power supplies, synchronization, deflection alignment, and antennas.

EET 307. PULSE AND DIGITAL CIRCUITS. Class 3, cr. 3. Prerequisite or corequisite: EET 203.

A study of waveshaping, pulse generation, switching, logic circuits used in digital computers, sweep circuits, and synchronization.

EET 321. GENERATION AND TRANSMISSION OF ELECTRICAL POWER. Class 3, cr. 3. Prerequisite or corequisite: EET 211.

A study of the transmission and distribution of electrical energy from the generating station to the consumer. A study of the power plant, electrical power generation, transformers, distribution and transmission, and power system loading.

EET 363. FCC EXAM PREPARATION. Class 1, cr. 1. Prerequisite: consent of instructor.

Review of electrical and electronic theory and the study of rules and regulations of the Federal Communications Commission to prepare for the first and second class FCC license. The FCC license is required for the operation and maintenance of many types of communications, broadcast, industrial, and aviation equipment.

EET 376. ELECTRONIC TROUBLESHOOTING LABORATORY. Class 1, Lab. 3, cr. 2. Prerequisite or corequisite: EET 213.

Experimental work in analyzing and repairing equipment. The use of test instruments to locate faulty components in AM and FM receivers, television, and industrial circuits.

GENERAL STUDIES

D. Sams, Acting Head of the Department

Professor: R. F. Schwarz.

GNT 220. TECHNICAL REPORT WRITING. Class 3, cr. 3.

Extensive application of the principles of good writing in industrial reporting, with emphasis on the techniques of presenting information graphically as well as in a clear, concise written form.

GNT 250. APPLIED CREATIVITY FOR BUSINESS AND INDUSTRY. Class 3, cr. 3.

A study of the ways individuals can become more creative and how they can develop an environment which encourages creativity from employees.

INDUSTRIAL EDUCATION

M. Eddy, Head of the Department

IED 110. INTRODUCTION TO INDUSTRIAL EDUCATION. Class 1, cr. 1.

Overview of industrial education with

emphasis upon its function and structure in industry and the public school.

INDUSTRIAL ENGINEERING TECHNOLOGY

W. E. Thomas, in Charge of Curriculum

Associate Professors: J. R. Blackwell, R. M. Bobillo.

IET 104. INDUSTRIAL ORGANIZATION. Class 3, cr. 3. Not open to students who have completed IET 105 and/or 106.

A detailed survey of organizational, financial, marketing, and accounting activities; duties of management, planning, control, personnel, safety, wages, policy, and human factors necessary for effective management.

IET 120. SYSTEMS AND PROCEDURES. Class 3, cr. 3.

An introduction to the systems concept. Surveys recognizing and defining the system's problem; the management audit and tools for systems analysis; design and control of forms, work simplification, work measurement and procedures; operations research; punched card systems; management and administration; and organization of the systems function.

IET 204. TECHNIQUES OF MAINTAINING QUALITY. Class 2, Lab. 3, cr. 3. Prerequisite: MA 150.

An analysis of the basic principles of quality control. Includes statistical aspects of tolerances, basic concept of probabilities, frequency distribution, X & R charts and uses of mechanical, electronic, air and light devices for checking and measuring to determine quality levels of acceptance.

IET 220. CRITICAL PATH ANALYSIS. Class 1, Lab. 3, cr. 2.

Detailed study of planning and control of a schedule by network techniques, including the time/cost analysis of CPM scheduling for application on construction projects, job shop scheduling and related problems. Includes an introduction to PERT and the use of the computer for network analysis.

IET 224. PRODUCTION PLANNING AND CONTROL. Class 2, Lab. 3, cr. 3. Prerequisites: MET 180 and IS 252.

Reproduction planning of the most economical methods, machines, operations, and materials for the manufacture of a product. The planning, scheduling, routing, and detailed procedure of production control.

IET 250. FUNDAMENTALS OF PRODUCTION COST ANALYSIS. Class 2, Lab. 2, cr. 3. Prerequisite or corequisite: IET 104.

Surveys of fundamental mechanics of accounting, principles of account classification, financial and operating statements, and the generation of cost data according to cost accounting principles. Surveys the generation of cost data according to the principles of engineering economy. Examines applications of cost accounting data and engineering economy cost data to specific management decision areas through selected case problems.

IET 262. MOTION STUDY AND WORK METHODS. Class 2, Lab. 3, cr. 3. Prerequisite: IS 252; prerequisite or corequisite: MA 112 or equivalent.

The study of the various techniques of motion study including process charts, operation charts, multiple activity charts, micro and memo motion study, therbligs, the movie camera, along with actual practice in their use. Includes study and application of the basic principles used to develop better methods of performing work.

IET 266. WORK MEASUREMENT AND INCENTIVES. Class 2, Lab. 3, cr. 3. Prerequisite: IET 262.

A study of the fundamentals of time study and work measurement with actual practice in their use. Includes stop watch time study, measuring work with movie camera, the establishment of allowances by both stop watch and work sampling studies, the establishment and use of predetermined time values, and the construction and use of work measurement formulae.

IET 272. JOB EVALUATION. Class 2, cr. 2. Prerequisites: IS 252 and MA 112.

A survey of the basic principles and significance of job evaluation. An analysis of current practices and techniques used in job analysis, job descriptions, and job evaluation.

IET 280. WAGE INCENTIVES. Class 2, cr. 2. Prerequisites: IET 260 and 272.

An analysis and study of the various types of wage incentive plans, their significance, adaptability, effectiveness, and equitability. A systematic appraisal of the basic objectives and currently used techniques in the administration of wage incentive programs.

IET 296. INDUSTRIAL TECHNOLOGY CASE PROBLEMS. Class 2, cr. 2.

Application of theories developed in the several industrial technology courses to select general case problems—to provide practice in the integration of principles.

INDUSTRIAL SUPERVISION

T. F. Hull, Head of the Department

IS 240. LABOR RELATIONS PROBLEMS. Class 3, cr. 3.

Introduction and overview of the industrial personnel manager's occupation. Educational and other characteristics related to the functions performed and the services rendered.

IS 252. HUMAN RELATIONS IN INDUSTRY. Class 3, cr. 3.

Study of the bases of human relations and the organization of individual and group behavior. Special emphasis on typical industrial and business relationships in everyday situations. Examines fundamental relationships between behavior and personal and group forces.

IS 262. SUPERVISED WORK EXPERIENCE. Cr. 3.

May be repeated to a maximum of nine.

Supervised work experience directed toward providing orientation, background, and insight into industrial operations. Technical and industrial jobs or participation in industrial training programs are typical examples of acceptable experiences. Consent of department required.

IS 268. ELEMENTS OF LAW. Class 3, cr. 3.

An introductory law course with a brief comparison of the American federal system and the parliamentary system of government, and covering law with em-

IET 312. MATERIALS HANDLING. Class 3, cr. 3. Prerequisite: IET 104.

A survey of materials handling elements, the unit load, packaging, bulk handling, the economics of materials handling, improving existing handling methods, justification for handling equipment, special handling techniques, and the management of the materials handling division in the industrial organization.

phasis on judicial review, and court jurisdiction and procedure generally and basic law in particular.

IS 331. OCCUPATIONAL SAFETY AND HEALTH. Class 2, cr. 2. Consent of instructor.

A study of the industrial accident problem and its control. Accident analysis through the modern accident prevention philosophy of causation control. Accident prevention training; organization for accident prevention; workmen's compensation laws.

IS 374. INDUSTRIAL SUPERVISION. Class 3, cr. 3.

Introduction to and overview of the function of supervision in business, industry, and government. Emphasis on the importance, practices, and characteristics of the supervisor.

IS 375. BASIC METHODS OF INDUSTRIAL TRAINING. Class 3, cr. 3.

Principles, practices, and variations of basic methods of instruction as related to training situations in business and industry.

IS 376. PERSONNEL PROBLEMS IN INDUSTRY. Class 3, cr. 3.

Analysis of selected case problems, with emphasis on attitudes, philosophies, and responsibilities of supervisory personnel in relationship to the worker.

MECHANICAL ENGINEERING TECHNOLOGY

W. E. Thomas, in Charge of Curriculum

Associate Professor: F. R. Lisarelli.

MET 100. APPLIED ENGINEERING COMPUTATIONS. Lab. 3, cr. 1.

Practical application of the proper use of the slide rule, desk calculator and introduction to the electronic computer and dimensional analysis. How to draw graphs and introduction to means of their reproduction.

MET 180. MATERIALS AND PROCESSES. Class 2, cr. 2.

Application and characteristic, both physical and chemical, of the materials most commonly used in industry; the mechanical processes by which materials may be shaped or formed.

MET 200. POWER SYSTEMS. Class 3, cr. 3. Prerequisite: PHYS 220.

A survey of steam and nuclear power plants, internal combustion engines, gas turbines, pumps, compressors, fans and blowers, refrigeration. Some theory in thermodynamics, combustion of fuels, heat transfer. Power generation and application to various fields with special mention of transportation.

MET 204. PRODUCTION DRAWING. Lab. 6, cr. 2. Prerequisite: EG 110; prerequisite or corequisite: MET 180.

Preparation of working drawings from layouts, drafting simplification, functional dimensioning, assembly drawings, detailing of machine elements, working with manufacturers' catalogs, applying fits, limits and tolerances to dimensions for interchangeable manufacture; information as to material, physical treatment, and manufacturing processes. The student works from layouts with a minimum of information so that self reliance in detailing may be developed.

MET 210. APPLIED STATICS. Class 2, cr. 2. Prerequisite or corequisite: MA 150.

Force systems, resultants and equilibrium, centroids of areas and centers of gravity of bodies, trusses, frames, beams, friction and moments of inertia of areas and bodies.

MET 211. APPLIED STRENGTH OF MATERIALS.

Class 4, cr. 4. Prerequisite: MET 210; prerequisite or corequisite: MA 221. Principles of applied strength of materials primarily with reference to mechanical design.

MET 216. MACHINE ELEMENTS. Class 4, cr. 4. or Class 3, Lab. 2, cr. 4. Prerequisites: MET 204, 211, and MA 221.

A survey of the more important elements used in tools and machines, and their general characteristics pertaining to application, operational behavior, efficiency, economy, and standardization.

MET 232. DYNAMICS. Class 3, cr. 3. Prerequisite: MET 216.

Basic fundamentals of dynamics; displacement, velocities, accelerations, work, energy, power, impulse, momentum, and impact.

MET 236. JIG AND FIXTURE DESIGN. Lab. 6, cr. 3.

Application of principles in the design and construction of drilling, milling, reaming and assembly jigs and fixtures; information related to materials, heat treatment and cost estimating. Gaging characteristics, selection and design for interchangeable manufacture.

MET 256. MATERIAL FABRICATION. Class 2, cr. 2. Prerequisite or corequisite: MET 180.

A study of the physical characteristics of metals and on-metals with respect to their behavior during fabrication; methods of material removal; elementary aspects of machine tool operation and tooling requirements.

MET 300. APPLIED THERMODYNAMICS. Class 3, cr. 3. Prerequisite: MET 100.

Fundamentals of thermodynamics including applications of first and second laws, enthalpy, entropy, reversible and irreversible processes.

MET 330. INTRODUCTION TO FLUID POWER. Class 3, cr. 3.

A study of the development, transmission and utilization of power through fluid power circuits and controls.

NURSING

H. R. Johnson, Head of the Department

Section Chairman: B. A. Schaapveld.

Associate Professor: B. A. Schaapveld.

Assistant Professors: M. Bourgeios, I. Brunner, G. Chamberlain.

Instructors: A. Baughman, P. Dunham, D. Schlake, M. Whitlow, P. Wringer.

NT 115. NURSING I. Class 4, Lab. 6, cr. 6.

This course presents commonalities of the fundamental processes of illness, basic concepts in nursing and fundamental skills in patient care. Content is developed through use of the problem-solving method in the classroom, university and hospital laboratory, and students' oral and written communications.

NT 116. NURSING II. Class 4, Lab. 6, cr. 6.

The content of this course involves the individual's response to malfunction of the body processes. Emphasis is placed on the nursing problems involved in the prevention of disease and promotion of health of the adult and child medical and surgical patient. Content is based upon scientific principles from allied fields and includes nursing care, treatment, drug therapy, and dietary management.

NT 224. NURSING III. Class 5, Lab. 15, cr. 10.

This course is a continuation of NT 116 and utilizes scientific principles from the allied fields. Learning opportunities are directed towards greater depth of understanding of the complex nursing care which includes treatment, dietary management, and drug therapy.

NT 225. MATERNAL AND CHILD HEALTH NURSING. Class 3, Lab. 6, cr. 5.

The nursing concepts in maternal and

child nursing are related to the emerging family group throughout the maternity cycle and preschool age. Deviations from the normal maternity cycle and diseases and conditions common in child development are included. Emphasis will be placed on the physical, social, and emotional responses to health and illness. Appropriate community resources are utilized as available.

NT 240. PSYCHIATRIC-MENTAL HEALTH NURSING.

Class 3, Lab. 6, cr. 5. Prerequisite: NT 116.

NT 224 and 240 must be taken concurrently due to correlated instructions.

NT 240 stresses the patient's behavior and the nurse's reaction. Based on knowledge previously acquired, this course enlarges upon the principles and techniques of the nurse's role in the multiple approaches and therapies currently used in treating patients who are mentally ill.

NT 280. ISSUES IN NURSING. Class 3, cr. 3.

This course enables the student to identify and understand the historical basis for problems in nursing and to become aware of the nurse's responsibility toward solution of these problems. Content also includes career opportunities, professional organizations, community and world health organizations, legal and ethical implications and methods of planning and assigning nursing care.

ADMINISTRATIVE AND INSTRUCTIONAL STAFF

- CHARLES A. ABRAHAM (1969)...Lecturer in
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- DAVID BRUBECK (1967) Director,
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- RUTH DANALD (1967)..... Instructor in
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- FREDERICK R. LISARELLI (1946) . . . Associate Professor of Mechanical Engineering Technology
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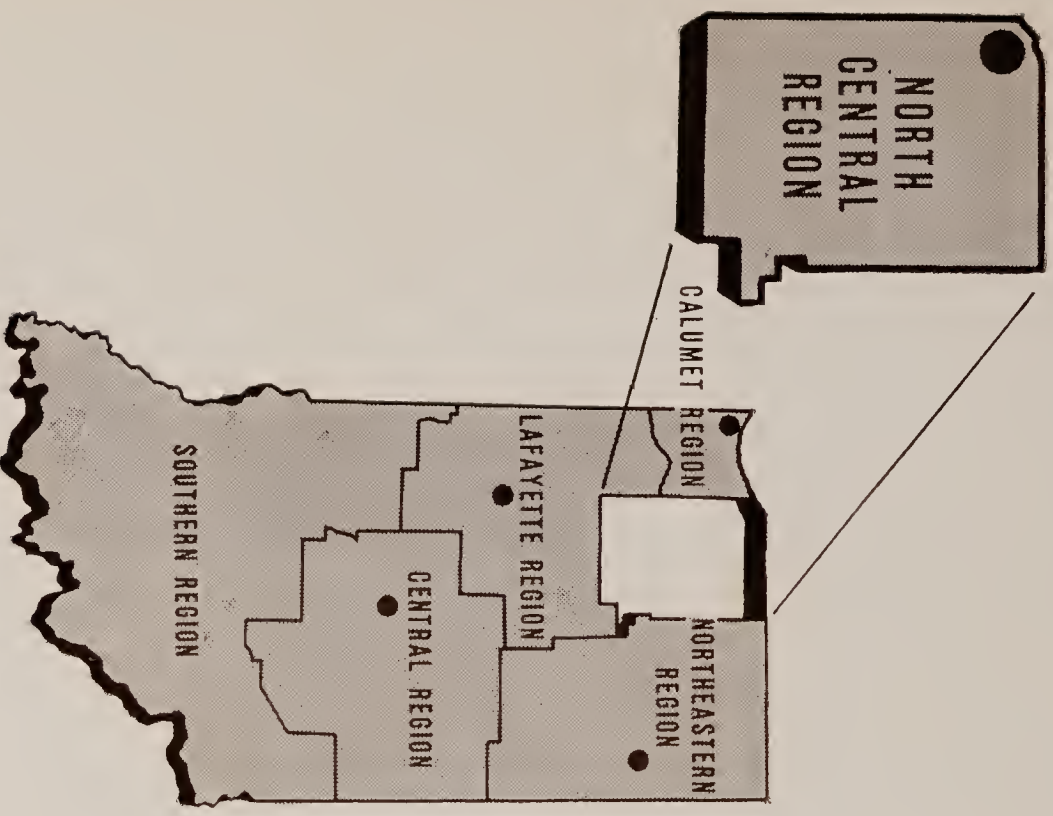
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